

The University of Chicago

MUNICIPAL WATER-UTILITY MANAGEMENT

A PART OF A DISSERTATION SUBMITTED TO
THE FACULTY OF THE SCHOOL OF BUSINESS
IN CANDIDACY FOR THE DEGREE OF DOCTOR
OF PHILOSOPHY

1937

By

E. GROSVENOR PLOWMAN

Private Edition, Distributed by
THE UNIVERSITY OF CHICAGO LIBRARIES
CHICAGO, ILLINOIS

Reprinted from
THE JOURNAL OF BUSINESS, Vol. X, No. 3, July 1937
Vol. X, No. 4, October 1937; Vol. XI, No. 2, April 1938

The University of Chicago

MUNICIPAL WATER-UTILITY MANAGEMENT

A PART OF A DISSERTATION SUBMITTED TO
THE FACULTY OF THE SCHOOL OF BUSINESS
IN CANDIDACY FOR THE DEGREE OF DOCTOR
OF PHILOSOPHY

1937

By
E. GROSVENOR PLOWMAN

Private Edition, Distributed by
THE UNIVERSITY OF CHICAGO LIBRARIES
CHICAGO, ILLINOIS

Reprinted from
THE JOURNAL OF BUSINESS, Vol. X, No. 3, July 1937
Vol. X, No. 4, October 1937; Vol. XI, No. 2, April 1938



Reprinted for private circulation from
THE JOURNAL OF BUSINESS OF THE UNIVERSITY OF CHICAGO
Vol. X, No. 3, July, 1937
PRINTED IN THE U.S.A.

E. GROSVENOR PLOWMAN

MUNICIPAL WATER-UTILITY MANAGEMENT

E. GROSVENOR PLOWMAN¹

MANAGEMENT AT THE TRUSTEESHIP LEVEL

WHY A TRUSTEESHIP LEVEL?

IN A small private business, all management activities are concentrated in the owner, who assumes full responsibility and has full authority. In the large private business, different types or levels of management activity have developed, at the top of which is customarily the board of directors, a group representative of the owners. Except in the very largest businesses, with widely diffused stock ownership, this board of directors may be said to be, in practice, the ownership group.

The moment a proprietary activity or business enterprise is purchased or established by a government, some sort of trusteeship level of management must be created. It is impossible for the thousands—perhaps millions—of citizen-owners to manage the business personally. Nor can any single person or group of persons, no matter how elected or appointed, be said to be the owners of the business and therefore entitled to the rights and subject to the responsibilities of the private board of directors. The elected or appointed top management level in the case of the public business is necessarily a sort of trusteeship level. He or they have in some manner been legally clothed with power to manage a business they do not and cannot own, in any personal sense. "Trusteeship" is used here in its broadest sense, to indicate responsibility to the public rather than to imply any uniform legal responsibility.

TYPES OF ORGANIZATION OF THE TRUSTEESHIP LEVEL

Municipal water-utility organization commonly follows one of four general patterns:

1. The water utility may be incorporated into the older city departments more or less completely. In such cases the trustee-

¹ Professor of marketing and business research, University of Denver.

ship level consists of the elected city council and the elected, salaried mayor. In addition to his trusteeship duty of approving legislation, the mayor is also usually the city's executive.

2. The water utility may be more or less completely incorporated into the older city departments; but, under the so-called "council-manager plan," the trusteeship role of the elected city council and mayor is completely separated from the executive function, the latter being delegated to a salaried, appointed city manager. The city manager is not a member of the trusteeship level group. Instead, he reports to it.

3. The water utility may be more or less separated from the older city departments and put under a separate trusteeship level committee, called the "water board." This elected or appointed water board is more or less independent of the city council and mayor.

4. The water utility may be completely separated from the ordinary city government and organized under a utility district, which has its own trusteeship level, an elected or appointed utility district board. Such a board may or may not have other utilities under its direction, as well as the water utility.

5. There are in addition, of course, mixed forms and transitional forms. Thus the commission form of municipal government is a variation of the first plan, often resulting in both an elected, salaried mayor and an elected, salaried water commissioner, both of whom are partly at the trusteeship level, as members of the city council, and partly at the executive level, as department heads.

Examples of the first method of organization in which the trusteeship level includes the elected, salaried mayor who is also chief executive of the city are New York, Baltimore, Cleveland, Chicago, Milwaukee, and El Paso. Cities where trusteeship and executive direction have been separated by means of the appointed, salaried city-manager device are Cincinnati, Kansas City, Oklahoma City, Dallas, Fort Worth, and Sacramento. Cities where the public's trustees consist of a water board plus, to a greater or lesser degree, other public agencies, such as the city council, are Erie, Detroit, Des Moines, Louisville, New Orleans,

and Denver. This sample is taken entirely from the list of ninety-six major metropolitan centers of the United States and indicates that these three forms of organization have large and important representation.

This is also true of the fourth form of organization, the separate utility district with a mandate direct from the state. Metropolitan centers where this type of organization predominates are: Boston, with its metropolitan water district wholesaling water to twenty cities; Washington, with its supply aqueduct under the army engineers and its Washington suburban sanitary district created by the state of Maryland to sell water at retail in suburban areas and for other purposes; Omaha, with its state-created utilities district furnishing water, gas, and ice; San Antonio, with its city-purchased private water utility operating under a self-perpetuating board of trustees until the revenue bonds are paid off in 1965; Los Angeles, with its metropolitan water district of southern California, building a \$200,000,000 aqueduct for Colorado River water, which it plans to wholesale to thirteen municipalities; and San Francisco-Oakland, with its district-type San Francisco public utilities commission and its East Bay municipal utility district, operating on opposite sides of the bay.

Mixed and transitional forms of organization are also rather common. For example, San Diego, in 1934, had a city council, a water commission, a city manager, and a salaried mayor, all having to do with the water-utility's management. Salt Lake City, in 1934, operated under the commission form of government, one elected commissioner being designated mayor and another elected to the post of water commissioner, both being members of the city council. St. Louis, in 1930, operated under a city council and mayor by way of a board of public service consisting of the president, the director of streets and sewers, the director of public welfare, the director of public safety, and the director of public utilities, the city water commissioner reporting to the latter official. In these cases it is especially difficult to draw the line between the trusteeship and the executive levels of activity. Since such plans can be broken down into attempts to develop toward the council-city-manager plan of organization, or toward the

semi-independent water-board type of trusteeship level, they have been designated as "mixed and transitional" and will not be discussed further.

A convenient method of indexing the four main types of organization of the municipal water utility is as follows:

1. The council-mayor plan and the council-city-manager plan treat the water utility as a subdivision of the total activities of the city. It may be completely "built-in," like the foreign sales department within the total sales department of some private business, or it may be given a high degree of integrated departmental unity. As a separate department it might be compared with the usual departmentation of private business, the basis of departmentation being the commodity or the service rather than geography or function. This separate departmentation has its origin also in the legal distinction between a typical governmental activity and a proprietary activity for which the municipality makes a direct charge.

2. The water-board plan treats the water utility in much the same manner as a subsidiary corporation is related to its parent holding company. The degree of autonomy of the water-utility subsidiary depends partly upon the organization plan, but even more upon the trend of the line of decisions concerning this relationship.

3. The utility district is like an independent corporation, created as a separate entity by the state.

DUTIES AND RESPONSIBILITIES OF THE TRUSTEESHIP LEVEL

When the Detroit water board was created in 1918, the enabling section of the charter made a detailed statement of the responsibility and authority of the new board. The following summary covers, therefore, the typical duties and limitations of the water-utility trusteeship level.

From the time of purchase in 1836 until 1852 the Detroit water utility was managed by committees of the common council. This management method gave way to an independent utility district board under a special state law because the council was permitting annual deficits between income and expense, the latter

including debt service. In 1918, when a new charter was adopted, the water utility was placed under a subsidiary water board.

This management committee, to which the trusteeship level duties and responsibilities have been almost entirely delegated, is recognized as an integral part of the Detroit city administration. Its four members are appointed by the mayor for four-year terms. In the words of the charter, they "shall be subject to removal from office by the mayor without cause assigned."^{1a}

The Detroit water board is given, by the charter, complete and unrestricted power and responsibility over the following matters: it appoints its own officers and executives and fixes their duties; it accounts for its own receipts and expenditures; it prepares its own detailed budget of expenditures; it must meet once a week, and "all meetings, records, and accounts of the board shall be public"; it is to operate, maintain, and construct the water system; it may enter into contracts for laying of water mains; it determines the rates to be charged, which must cover its expenses, including water debt service.²

The Detroit water board's power and responsibilities are limited in the following manner by the charter: the civil service commission has jurisdiction over all ordinary employees; the water board determines the compensation of all its employees, but this is subject to the approval of the common council; the board's money must be deposited daily with the city treasurer; payment vouchers issued by the board are valid only when approved by the city controller, who, among other things, checks the expenditures against the board's own budget; the water board must buy through the city purchasing agent; it must request the common council to institute condemnation proceedings when desired; it may make contracts, other than for laying mains, only with the consent of the council; it may enter the streets only "under the supervision and direction of the commissioner of public works," who charges costs of pavement restoration back to the board; its rules for collection of past-due water bills must be approved by the city council; it must report promptly on all matters referred to

^{1a} G. H. Fenkell, *A Descriptive Survey* (Detroit: Board of Water Commissioners, October, 1928), pp. 6-12.

² *Ibid.*

it by the city-wide bureau of complaints; it may sell up to 20 per cent of its total water consumption outside of the city limits, at rates not more than double the inside rates; all "outside-the-city" main extensions must be at the expense of others than the board, but must be deeded to the board; the water board must report annually, or oftener, to the common council, which is given the right to enact "such ordinances as may be necessary to carry out the provisions."³

The purpose of these latter reservations is twofold. Some are to force the semi-independent subsidiary to continue to use certain city-wide operating departments of functional type. Other reservations prevent the water board from having final authority in certain matters it is desired to have determined in other portions of the trusteeship machinery of the city government. Disregarding these reservations, we find the Detroit charter has designated as trusteeship duties and responsibilities the following: (1) internal organization of the board, including appointment of members, control of members, appointment of officers of the board and fixing of their duties; (2) appointment of executives of the water utility and fixing of their duties; (3) determining the compensation of all employees and the enforcement of civil service provisions; (4) accounting for receipts and expenditures, and actual care of the "money" itself; (5) preparation and enforcement of the budget; (6) making of contracts, instituting condemnation, and other legal problems; (7) determination of the rates to be charged and of the collection rules; (8) operation, maintenance, and construction of the water system.

In Des Moines the subsidiary water board consists of five trustees, elected by the city council upon nomination by the mayor. Members are elected for six-year terms but may be removed by the city council for cause. The state law creating such boards says that the intent is "to give such boards of water-works trustees complete management and control of said water-works."⁴

The only important reserved power is the duty placed upon the

³ *Ibid.*

⁴ "Act . . . regulating the operating of the water plant [of Des Moines, Iowa]," *Thirty-eighth General Assembly, State of Iowa*, pp. 3-8.

Des Moines city council to select an expert accountant to examine the books at least annually, the report being to the council. The law threatens board members and city council members with a fine of up to \$1,000 or jail up to six months for soliciting support or levying political contribution of employees.

The Louisville water utility illustrates the subsidiary-corporation method of organization carried to its logical conclusion of actual use of the corporate form. The city of Louisville was one of the original stockholders in the Louisville Water Company, organized in 1852. By acquisition of additional stock, the city was able to name the board of directors in 1906, and in 1907 it acquired complete ownership. It did not then liquidate the corporation but continued it under the management of the board of water works, consisting of five members, one of whom is the mayor, ex officio. The other members are appointed by the mayor for four-year terms, with the approval of the city council.

During three of the years of his term, the Louisville member serves at the nominal salary of \$600 per year. For the fourth year, he customarily serves as president of the corporation and is paid \$5,000 for the part-time duties of the office. The management of the water utility is under the complete control of the water board, and there are no matters reserved for other parts of the city government.⁵

The San Antonio water utility has been given utility district status by the special state law legalizing the purchase in 1925. This law created a board of trustees of five, one of whom is the mayor. After initial appointment by the mayor, the board has been self-perpetuating, filling its own vacancies except for the mayor. This will continue until 1965, when the purchase bonds will have been paid off. This independent board of trustees is given, by the law, complete and sole management and control over the San Antonio water utility, including full control of rates.⁶

The East Bay municipal utility district was organized as a result of studies by a mayor's committee representing nine

⁵ D. D. Gross, *Notes on Louisville, Kentucky* (Denver: Denver Water Department, June, 1934), pp. 1, 2.

⁶ City Water Board, *Rules and Regulations* (San Antonio: Water Department, April, 1934), pp. 9-11.

neighboring communities, the largest being Oakland, the territory corresponding approximately to the service area of the private East Bay Water Company, purchased in 1928.

The five directors are elected by the voters of the entire East Bay district but represent wards. The elected term is four years, and the director may run to succeed himself. Maximum earnings of the director are \$20 per month.

The East Bay district is a complete governmental unit with the power to engage in any kind of utility business within its area. So far it has concentrated on provision and distribution of water, which has led it into production and wholesaling of electricity. The district may issue bonds, upon vote of its citizens, within its debt limit. It may, and does, use a tax levy to make up the difference between revenue and expense. Its area may be expanded or contracted by the election route.

The only substantial difference between the East Bay district and a municipality is that the former is strictly limited by law to the proprietary type of activity, the so-called "economic services," such as water supply. It differs from the private corporation in having the power to tax in order to make up its deficits between income and expense, and in being managed by a committee, not of owners, but of elected trustees.⁷

Summary.—The five water utilities discussed above provide a scale of variation from the semi-independent subsidiary-corporation type of organization, through substantial independence, to complete independence. In the case of Detroit the trusteeship level of management is performed by the city council, the mayor, the civil service commission, and the water board, the latter having had delegated to it most of the important duties of management.

In the case of the East Bay district, on the other hand, complete power, including the power to tax, resides in the utility district board of trustees. Des Moines, Louisville, and San Antonio fill the gap between the two extremes of organization.

Basically, the trusteeship management level, in the water utility, is the general management level. The responsibility laid upon the trustees is to operate the business, to co-ordinate and

⁷ A. P. Davis, *Annual Report* (Oakland, Calif.: East Bay Municipal Utility District, 1927), pp. 12-14.

control its resources, human and physical, in order to render the best possible water-supply service.

THE MUNICIPAL WATER-UTILITY'S TRUSTEES

Study of various water boards and utility district boards leads to the conclusion that, as a class, the water-utility's trustees are high-type citizens who take a sincere interest in their duties and who work long hours at little or no pay. With management and policy power divided equally among the board members, the opportunity for personal profit or "graft" is small and seems to be very rare. Board members do exact petty favors from their water utility, such as patronage rights to place friends in employment, and rather often welcome promotion from honorary pay to one of the higher salaried positions with the water utility. Rarely could it be said, however, that such perquisites as are exacted exceed what the directors of a private corporation would consider reasonable.

Boards tend to be composed of older men. It is a mistake to think of water-utility trustees as being unimportant men. It is more correct to think of them as being "safe" men, whose attitude on various problems important to the appointing power has been tested by years.

An outstanding reason why younger men will not ordinarily serve on water boards is the usual charter or state prohibition against personal profit from a governmental position. This is because the water utility, in the course of the ordinary year, buys from or uses the services of a considerable portion of the more important businesses of the community. The younger man, active in business, must not only sacrifice time needed for his own work, therefore, but must also sacrifice business profits that might otherwise come his way.

Many older men refuse to serve, when tentatively canvassed, because of the rigidity and the implications of the provisions intended to prevent fraud and graft. Board members must commonly give bond; and older men know that the surety bond is sometimes collectible when no fraud has occurred, for example, in bank failure with water deposits involved. Viewed in this light,

board membership is not an honor to be coveted but a responsibility to be dreaded.

Once a board member has been appointed or elected, the employees of the water utility desire the longest possible service by this board member. This is because the board member learns slowly, as the problems of the business are turned up over a period of months of meetings. The board member tends to rely, in his early career on the board, too much upon outside experience, however valuable, and too little upon actual knowledge of the water-utility's particular problem. The board, with power spread evenly among the members, naturally listens to the "authoritative" statements of its members. Length of service is the only possible remedy for what might be called the "amateur experting" within the board of one member upon his fellows.

Length of service of water-board members is not determined by charter provisions but by the degree of deliberate interference by the appointing power. Thus the commissioners of water works in the city of Erie, organized on quasi-district lines in 1867 by act of the Pennsylvania legislature, are appointed by the court of common pleas of Erie County for a term of three years. From 1867 to 1933 there have been thirty-three commissioners, an average of eleven for each position. Each commissioner has served, therefore, an average of slightly more than six years, or two terms. One served fifteen years, another twelve, six for nine years each. Only three members have resigned in office. Only two failed to serve at least three years. In only eleven of the sixty-seven years, including the first three, was the board composed of members who had not served a total of more than nine years, or three years per member. During thirty of the sixty-seven years, the average service of the board was over three and under five years per member. During twenty-six years the average service was over five years. The post of secretary-treasurer of the board, top-salaried position, has never been filled by a person who, before or after, was a member of the board. One such secretary-treasurer served fifty-two years in all employments under the board. He died in office, after twenty-seven years as secretary-treasurer.

In contrast with this permanence and long service, with a three-

year term, the Denver charter provided for a six-year term for the five members of the water board, appointed by the mayor. In the eighteen years of existence of the Denver water board there have been twenty-three board members, giving an average term of less than four years. Eleven board members have resigned during their terms of office. Five members have exceeded six years of service, three of these being still in office, reappointed. The longest service to date is nine years, the member being still in office.

Of the six managers to date, two resigned from places as Denver water-board members to receive the salaried appointment; one had served as mayor and had appointed the board that offered him a post. The present top executive, however, is a long-service employee, having been originally employed by the private water utility before municipal ownership, more than thirty years ago.

A question of importance is the relative power and duties of the board president, usually elected by the board members from their own ranks. In Louisville, as already pointed out, the president is paid \$5,000 for his year's service. He has actual presidential duties because of the private corporation, still kept alive. The East Bay municipal utility district has re-elected the same member president, year after year. Although not paid more than his associates, the annual reports comment on the fact that he has spent part of every business day in his office. Evidently, by common consent, his duties are broader than those of the individual member. In Denver, on the other hand, the office of president has been rotated from member to member and may finally be limited to presiding over board meetings and to signing of authorized legal documents.

In general the power of standing committees within the board is sharply limited by the legal responsibility resting on the full board to pass all binding motions and make all final acts. Standing committees tend to be contact and research devices, recommending final actions to the board.

The device of "power to act" by which an individual board member is given the power to fill in the blanks left in a motion already passed by the board is an interesting technique for delegating power of the board for speed or efficiency reasons. In Denver such a device has often been used by the board, and many an

internal controversy has raged when the manner in which the "blank check" was filled out by the delegated member is spread on the minutes as an accomplished fact.

The right of the individual member of the trusteeship group to give direct personal instructions to any executive or employee is, in theory, limited, unless specific management authority has been delegated by law or by the board to the member. In practice it is a recurring problem, especially with respect to the "zealous" board member, who, practically retired from active business, finds interest and perhaps diversion in field "inspection" trips. It develops also when the trustee "orders" patronage employment favors or other perquisites. It is a constant source of uncertainty and disruption of organization.

This brief survey of water-utility trustees, especially as found in water boards and utility district boards, indicates that they are, in general, well qualified for the work of managing the water utility. It is clear, however, that the use of the trustee group as a complete "management committee" is hampered by the following problems: (1) the length of service of board members is an uncertainty; (2) the power of the president of the board is limited; (3) similarly, standing committees of the board cannot in practice acquire power and stability; (4) there is a legal inability to delegate the authority of the board, even to one of its own members, which makes even the device of passing a motion in blank, conferring "power to act" upon one of the board's own members in a particular case, difficult to use; (5) board members, attempting to cut across red tape by giving personal instructions to executives or employees, create confusion or raise ethical questions, both tending to prevent the board member from exercising any executive authority.

THE MAYOR AND TRUSTEESHIP-LEVEL ORGANIZATION

This report, up to this point, has shown that the top level of management activity in the municipal water utility is of trusteeship, rather than ownership, character. Trusteeship, in theory, is as broad a grant of the power to manage as is inherent in the board of directors' device of private business. In practice, as brought out in our survey of specialized water-board and utility-district

trustees above, there are important limitations upon the ability to manage due to the problems of length of service, of internal board organization, and of bridging the gap between trusteeship and actual operation.

Use of the council-city-manager plan of organization, as well as the specialized water-board and utility-district-board devices, attempts to solve this problem by making a distinction between the sweeping management powers and responsibilities of trusteeship and another type of executive activity, which, below in this paper is designated as "co-ordination." This additional level of management activity, more or less corresponding to the president or general manager of a private corporation, is, in such cases, organized as a single salaried executive, directly responsible to the trustees, called the city manager, the water department secretary or manager, the utility district secretary or manager. In this way the trustees, without breaking down the legal concept of their group responsibility for management, delegate the enforcement of their instructions to a paid, personal representative, who is responsible to them.

The council-mayor form of organization, and also the so-called commission form of organization, has the effect of designating certain members of the trusteeship group, namely, the elected mayor and, in some cases the elected water commissioner, as also having executive responsibility and power. To understand the difference between the two methods, it is necessary to visualize the status-conferring effect of election for a fixed term to a particular office. The mayor, having his own mandate direct from the people, can, and does, exercise his executive powers without any sense of responsibility to the city council. In a sense, therefore, this method of organization provides for separation of duties at different management levels, not for a true pyramid of executives heading up to the top trusteeship level. The mayor, heading the executive pyramid, is also, by virtue of the veto powers of his office, a member of the trusteeship group which exercises a restricted legislative responsibility. Instead of serving as a bridge between trusteeship and operation, the mayor, by virtue of his separate mandate from the people, often breaks the top management of the city into two parts. Under such circumstances the

city council, instead of being the trusteeship head of the city government, comparable to the private board of directors, either becomes an annoying dissenter and heckler of the mayor or is controlled through party machinery and made subservient to the mayor and his party.

The following outline of some phases of the history of the Denver water utility bears directly on this question of what, in practice, a mayor's relations with the water-utility problem tend to be. Denver is well suited to this analysis, a sort of "jurisdictional" dispute having gone on for years between the water board and various arms of the city government, including the mayor and city council.

In 1909 an appraisal of the Denver Union Water Company was made jointly by the city and the company. This appraisal, which placed a value of \$4,000,000 on water rights and "going value," was unpopular with the public. As a result the public, in 1910, refused to purchase the property at its appraised figure, refused to renew the company's franchise for another twenty years, and, having thus expressed dissatisfaction with the council-mayor trusteeship activities, created an independent district-type municipal utilities commission. Members were elected for six-year terms, were paid a salary, and were instructed to make an offer of purchase at about half the appraisal figure, or \$7,000,000. When this offer was rejected, the public went to the polls again and instructed their commission to construct a "competitive" water system at an authorized cost of \$8,000,000. Attempts to do this proved a costly experiment, since \$1,149,600 in bonds was issued, being represented at present by a survey that was never used and by an irrigation canal system and reservoir of little direct value to the city but costing large amounts in water fund contributions for annual maintenance.⁸

From 1913 to 1916 the people of Denver experimented with the commission form of government. In 1916 the council-mayor form was restored. This 1916 plan provided for a strong mayor who would be the salaried but elected city manager, as mayors elected under the plan have sometimes stated.

⁸ The Public Utilities Commission, *Report* (Denver: City and County of Denver, 1910), pp. 3-45.

In 1918 the public approved the water board amendment to the city charter, and purchased the Denver Union Water Company at its appraised value. This amendment abolished the public utilities commission and created a board, appointed by the mayor, along lines closely resembling the Detroit plan, already presented. The water board was to be a semi-independent subsidiary of the city government, audited by the city auditor, its money deposited daily with the city treasurer, its legal opinions rendered by the city attorney, and its members appointed by the mayor. That this plan of organization is satisfactory to the public is shown by defeat at the polls of amendments, in 1922, and again in 1933, which would have abolished the water board and placed the water utility, as a department of the city government, directly under the mayor.

In 1918 the mayor of the city, advocating passage of the water-board amendment, told the public that the plan named a commission of five members to have exclusive control of the maintenance and operation of the plant, and authorized them to place a manager in the active management of the plant when acquired. Thus the mayor recommended creation of a separate water board, distinct from the city council and mayor, to serve at the trusteeship level, said board to be empowered to create an executive position under it of the responsible, salaried type already discussed. In 1919, after expiration of his term of office, this mayor was appointed to be first manager of the water utility.

In 1923, taking advantage of an opportunity to name three new members, majority of the board thus shifting, the incoming mayor was able to substitute for the first manager, a salaried secretary, described by the press as a "well-known" politician. In 1924 a water-board member resigned his place and was immediately elected salaried manager. In 1926 the mayor again created a new board majority, of three new members. Three months later this new majority resigned in a body, the press reporting inability to agree with the mayor on the proper policy concerning the new transmountain water supply. During the following three months the water board was unable to function for lack of a legal quorum.

At the end of this period the mayor again provided the water board with a new majority of three new members. The first action

of this new board was to discharge the chief engineer, who had served since 1918. In 1929 the water board accepted the new water supply plans and contracts, prepared for it by the mayor. The press stated the mayor would not reappoint two of the board members because they had opposed his policy in respect to this new water supply. The press also stated that the mayor was handling the details of doling out employment on the new construction work. In 1930 another board member resigned and was immediately appointed by the board as its salaried manager. This new manager was quoted by the press as saying: "The city now, however, has the strongest water board in years. With politics absolutely eliminated, and I believe they are now, the water plant can be operated as efficiently as any private business."⁹

In 1932 the new mayor used city funds to obtain confidential engineering and office practice reports, covering various aspects of the water board's work. In 1933 this mayor appointed two new members, achieving a new majority, which proceeded with the water-supply construction plans of his predecessor.

In contrast with this close interrelation between the mayor and successive water boards is the growing separation of the Denver city council and the water board. The city council has been gradually receding from its former position as an active participant at the trusteeship level in water-utility matters. The city council more and more treats the water board as the agency of the city responsible for trusteeship over the water utility. Where dual responsibility exists, as in initiating bond elections, the procedure of the city council is to act as little more than a routine expediter, leaving the responsibility for initiating and defending the proposed bond issue squarely on the water board.

One reason, aside from his power of appointment, for the relatively great success of the mayor in controlling the water board, thus making himself both the primary trustee of the public interest and also, to whatever extent he desires, the major water-utility executive, is to be found in the great variation possible between the strict and broad construction of the legal foundation

⁹ Newspaper reporter quoting Mr. C. C. Schrepferman, "Schrepferman Becomes Head of Water Firm," *Rocky Mountain News*, LXXI, No. 232 (August 20, 1930), 1 (home ed.).

of the water board. It is reasonable to assume that such great variation is present in most water-utility enabling acts. In Denver this spread between the two extremes in interpreting the provisions of the charter concerning organization and powers of the water board is well brought out in two opinions made public by the city attorney less than two years apart, from which the following quotations come:

[*Strict construction.*] It is inconceivable that the vesting in the Board of Water Commissioners of charge and control of a water works system could, by any possibility, be construed as giving them the general power to acquire property in the name of the City and County of Denver according to their judgment, discretion and action. . . .

The theory of the Charter, however, is that excess water rates pay off . . . the bond issues as promptly as possible . . . rather than that with an excess of available funds derived in any one year from water rentals, contracts . . . should be made by the Board (for major construction). . . .¹⁰

[*Broad construction.*] In my opinion, these charter amendments . . . have resulted in vesting in your board all powers of the city with respect of the management, control, extension, and improvement of the water system. . . . In performance of these charter duties, the board has all the powers which might be exercised by a private corporation, except as expressly or by clear implication limited, [for] the municipality . . . is exercising business or proprietary functions as distinct from those governmental in character.¹¹

There is no doubt that the combination of trusteeship-level powers and executive powers in the person of a forceful mayor does get things done. Without this combination Denver, for example, would probably not yet have made much progress toward its additional water supply, now nearing completion. Among the difficulties of the combination, from the standpoint of the water utility, are the following:

1. Change in the person of the mayor, resulting from elections, causes breaks, about-facing, and even undoing of the work of predecessors. Control of the water utility by the mayor causes such effects to be felt both in higher policy and in such operation

¹⁰ R. C. Hecox, *Brief on Extent of the Powers of the Board of Water Commissioners* (Denver: City Attorney, November, 1932), pp. 29, 45.

¹¹ H. McAllister, *Opinion Respecting the Validity (if Executed) of a Proposed Agreement* (Denver: City Attorney, November, 1934), pp. 7, 8.

matters as forced turnover to make room for the supporters of the new mayor.

2. To make his power over the water utility effective, the mayor must control or disregard other agencies within the city government that have, jointly with him, some trusteeship powers and duties. This sidetracking of the management committee or committees, converting them into followers instead of leaders, does not square with the popular American concept of plural organization of the trusteeship level of management of public business.

3. Cities operating their water utility as part of the general city government, under the city-council-mayor plan of top organization, tend to scatter the water utility among the older departments of the city government, in "built-in" style. This introduces many operating complications for the water utility; causes public annoyance and criticism because of divided responsibility and lack of co-ordination below the level of the mayor; and fails to give weight to the basic legal and psychological differences between the water utility, a proprietary undertaking, and the regular city activities or governmental undertakings. For example, in such cities the water utility's income is often not segregated or budgeted for meeting the water utility's expenses.

4. Mayors, because of their political interest in controlling policy and personnel throughout the city government, are notoriously poor delegators of authority and responsibility to subordinates. The system of mayor-trusteeship and mayor-management thus produces a flood of problems beyond the capacity and time of the mayor, all pressing for attention.

SUMMARY

Public businesses must necessarily be managed by trustees. The trustees, in theory at least, cannot delegate to anyone their management responsibilities, not even to one of their own members. Under the usual plan of divided organization, trusteeship responsibility for the water utility is shared by the city council, the mayor, and perhaps a civil service commission and the finance and accounting officers of the city. Typical solutions are to per-

mit the mayor to concentrate both trusteeship and executive control of the water utility; to create a salaried city manager, responsible to the city council; to create a water board, usually responsible to the mayor; or to create an independent water-utility district board.

The city-council-mayor plan of trusteeship brings, through the person of the mayor, a composite responsibility for trusteeship and for executive control into the top group of elected officials. The city-council-city-manager plan separates these two levels of management activity.

The water-board plan of organization of trusteeship also separates the two levels of management activity, trusteeship and executive co-ordination. It does not contribute to reducing the internal conflicts between different groups and individuals except in so far as, over a period of time, major responsibility for trusteeship activities tends to drift toward the water board.

Establishment of a utility district board also permits a clean-cut separation of trusteeship, exercised by the board, and executive co-ordination, delegated by the board to salaried executives. This plan clarifies the question of who is responsible for the trusteeship activities, since the board is an independent unit of government.

The city-council-mayor plan of organization may be highly effective from time to time, depending on the particular mayor and the particular circumstances. Its greatest defect is its tendency to scatter the water utility throughout the rest of the city government in "built-in" fashion. To be successful, it may run counter to popular public belief in the management committee as the trusteeship device.

Members of management committees, such as water boards or utility district boards, are not able to assume responsibility for executive co-ordination because of their own short service and because of difficulty in acting except as a group assembled in a meeting.

[To be continued]

BOOK REVIEWS

Our Silver Debacle. By R. B. WESTERFIELD. New York: Ronald Press, 1936. Pp. vii+214. \$2.50.

The certainty that monetary questions, always a "most puzzling mystery to the great body of our people," would play a prominent role during 1936, both in Congress and in the impending presidential election, plus the urgent need for a college textbook or reference book on the subject, has induced Professor Westerfield to write this volume.

The author's position on the silver question is unmistakably clear. He states:

The appeal, "do something for silver," has gone down the ages. The occasion is ever the same, namely, the industry is threatened or prostrate. The appeal is ever the same: it is a cry for help to a special group of citizens at the expense of the whole people; it is a cry directed to the political authorities demanding government intervention against the social and economic trend of the day . . . [pp. 3 and 4].

The book is devoted in the main to twentieth-century developments in the United States in respect to silver. This period was found to divide itself conveniently into "two fairly distinct episodes": (1) "a resurrection of the silver problem by the World War" and (2) "a second resurrection by the World Depression" (p. 10). The second episode is accorded the major portion of the attention, including the consideration of topics of which the following are representative: "The Depression and Silver," "Whooping for Silver in Congress," "The Dies Bill and the Silver Purchase Act," "Effect of American Policy on Mexico," "India Reverses Her Traditions," and "Did the United States Help China and Promote Recovery?"

The New Deal is charged with a flagrant contradiction in policy, for, while it regards economic planning as an inevitable substitute for laissez faire in the directing of economic activity, it nevertheless adopts a silver program which is a ". . . blighting indictment of national planning in the United States, for it purposely stimulates production and reduces consumption of a product already notoriously superabundant . . . and for no earthly reason but politics" (p. 163).

While admitting that the silver problem, occasioned by the vast

purchases on the part of our government, cannot be solved on an economic basis, Professor Westerfield nevertheless does believe that his suggested nine-point compromise program, a compromise between economics and politics, "... will at least save the situation from becoming utterly intolerable within a short time" (p. 199). Among other things the plan calls for the immediate cessation of all silver purchases, both domestic and foreign, and for a direct subsidy to the domestic producer of silver, as a substitute for the present aid being received, "whenever the price falls below 65 cents a fine ounce" (p. 199).

Readers should find this book not only instructive but also intensely interesting.

F. J. ELLERMAN

New York University

Introduction to Corporate Finance. By JOHN C. BAKER and DEANE W. MALOTT. New York: McGraw-Hill Book Co., 1936. Pp. xxii+382. \$3.00.

This is another case book after the Harvard fashion. The cases or problems are presented under the topics "The Corporation, Financial Instruments and the Capital Structure," "Procuring Funds for a Corporation," "Management of Working Capital," "Management of a Corporation's Capitalization," "Valuation and Combination," "Recapitalization and Reorganization," and "Financial Institutions."

Introductory notes preface each topic group of cases. These notes are designed to indicate the significance and scope of each major case group. A list of selected reading references appears at the close of each section and of the book. This list seems to contain materials readily available to students in all institutions who are likely to use the case book. Obviously the references are designed to furnish the student with information and technique useful in dealing with the cases.

There are five appendixes. One briefly outlines the ratio method of analyzing comparative balance sheets and statements of income and expense. The other four are briefly descriptive of the Securities and Exchange Commission, the R.F.C., the Farm Credit Administration, and the Federal Reserve System.

The rationale of the topic outline baffles this reviewer. The second, third, fourth, and fifth topics all seem to be dealing with financing policies, and this makes rather unnecessary the final topic. The cases, as is probably inevitable, have vacuums so far as completeness of data

is concerned. The first appendix should be expanded and made chapter i. The last two appendixes seem hardly worth including. Certainly an approximately three-page description of the new Federal Reserve will more likely confuse than enlighten a student who is presumed to need the information. Appendix space might better be used to present data dealing with companies, industries, general business fluctuations, securities' price trends, etc.

Taken as a whole, however, the cases seem to have been carefully selected. Nearly all fields of private enterprise are considered. The introductory notes and reference lists are a distinct improvement over most of the other case and problem texts. Whether it is suitable for an introductory course in corporation finance depends upon one's ideas of what such a course should be. There are many "advanced" (?) courses for which these cases would hardly classify as "duck soup."

S. P. MEECH

University of Chicago

The Economics of Consumption. By CHARLES S. WYAND. New York: Macmillan Co., 1937. Pp. ix+365. \$3.50.

The Economics of Consumption presents an inquiry into the "nature and relative importance of the forces underlying and governing consumption." It stresses the importance of information concerning the consumer and his consumption activities as a means of securing not only efficient consumption but also profitable production. Because of the delimitation of profits resulting from decreased productivity due to the industrial revolution, producers, according to Mr. Wyand, are being forced to consider the welfare of consumers. Perhaps this thesis can be defended if the "welfare of the consumer" is broadly interpreted to include lowering prices in the face of business recession, or other manipulation designed to stimulate or maintain sustained business activity which ultimately results in the welfare of the consumer. However, as Mr. Wyand himself points out, the business man is interested primarily in profits and only secondarily in the consumer and there is little concrete evidence to show that delimitation of profits has changed this basic aspect of our profit economy.

The book defines a consumer as "any person whose productivity as measured by his current income is less than current expenditures for the satisfaction of his personal wants." Such a definition is artificial and serves no useful purpose in analyzing and studying consumer activities and interests. Consumers cannot be segregated as a special

class on the basis of productive activities. Each individual is a consumer, and the fact that definite persons cannot be picked out and designated as a special class known as consumers in no way alters the fact that all people act as consumers in certain of their activities and interests. Hence, any attempt to segregate consumers as a class fails to take into account one of the basic characteristics of consumption activities.

The major portion of the book is concerned with a discussion of consumer choice, considered from the physiological, biological, psychological, philosophical, anthropological, sociological, and economic viewpoints. As the author is apparently aware, from his remarks in the Preface, this "mounting on horseback and riding off in all directions" achieves a very diffuse result which gives the chapters on choice a lack of definite orientation and integration. The heavy documentation and ubiquitous quotations add to the general impression that the large mass of assembled facts needs further digestion and integration.

The chapters on existing market setup and governmental agencies as determinants of choice, as well as the chapters on the economic significance of choice, are the best in the book. They lead one to wish that the inquiry had been more closely confined to the field of economics.

Throughout the book one is assailed by reiteration that the day of the consumer is at hand. This assertion is based on the idea that producers are now in a position where they are forced to concern themselves with consumer welfare. The productive system has always supposedly been operated in the interests of consumers, yet there is ample evidence to prove that in many ways it has served consumers badly, as Mr. Wyand takes pains to point out. No immediate or drastic change in the system seems indicated by any data available at the present time, in spite of the lip service of certain New Deal agencies. Therefore, the statement that "the consumer and his problems can no longer be ignored" seems to represent a wish rather than a possibility with reasonable hope of fulfilment.

URSULA BATCHELDER STONE

The Economics of Money, Credit and Banking. By F. CYRIL JAMES.
New York: Ronald Press, 1935. Pp. xvii+678. \$4.00.

This volume is one of six or eight appearing in recent years designed primarily as texts for the first course in money and banking. These

books all discuss the recent developments in our financial system which have resulted from changed economic conditions or banking and currency legislation. In general, there is a striking similarity between these various works. There is little disagreement in the statement of monetary or banking principles. Their justification for separate existence seems to rely mainly upon the style of the author, whether the subjects of money and banking should be treated separately or as inter-related, whether chapters on the history of banking in the United States should be included, whether attention should be given to types of financial institutions other than the commercial bank, and whether a few chapters dealing with the high points of foreign banking systems should be added.

The volume under discussion is a very much enlarged re-writing of the book which appeared in 1930. There are a few brief chapters on money at the beginning, but the author then turns to a discussion of credit and the development and functions of the commercial banking system and from this point on the chapters on money and financial institutions are interwoven to show the interdependence of these subjects. This, it seems to us, is the logical method of presentation.

Early experiments in banking in the United States and the National Banking Act are treated rather briefly but probably adequately for a text which deals primarily with principles. A considerable amount of attention is given to recent banking legislation but the manuscript was apparently completed before passage of the Act of 1935.

The author devotes eight of the thirty-one chapters to a discussion of financial institutions other than the commercial bank. He presents a survey of the whole list of the various types and thus completes the picture for the student, but perhaps in an endeavor to keep the book to a certain size the treatment of some of them is not very comprehensive.

The book is written in a pleasing style and aimed, apparently, at the senior college level. It is the opinion of the reviewer, however, that in those institutions in which the material is offered to Freshmen it will be found to be presented in a more simplified form by one or two of its competitors. At the end of each chapter there is a comprehensive bibliography which should be of assistance to many teachers. The Index is somewhat abbreviated.

J. WARREN STEHMAN

University of Minnesota

Problems in Industrial Purchasing. By HOWARD T. LEWIS. New York: McGraw-Hill Book Co., 1935. Pp. 498. \$5.00.

In recent years the market has been flooded with books on industrial marketing as if an entirely new bonanza field for research had just been discovered. These authors labor under the impression that industrial marketing is so uniquely distinctive as to justify separate and exhaustive treatment of every phase of the subject. In line with this trend is the book under review.

Problems in Industrial Purchasing presents a compilation of seventy-one cases in purchasing obtained from manufacturing, utility, and institutional organizations. The problems are presented in logical sequence, dealing first with the nature of the purchasing function, then successively with purchasing procedure, quality and quantity control, selection of sources, price policies, speculative purchasing, and the measurement of performance. The style is fluent and lucid and the facts contained in the problems are legion.

The book is not, however, without its defects. Some problems, like Problem 14, are pointless. Others represent nontypical situations, as exemplified by Problem 9, which deals with the purchase of advertising space and involves the purely technical question of whether authority to buy it should be vested in the advertising manager or the purchasing agent. Some of the problems contain an undue amount of extraneous matter which relates only most remotely to purchasing. A case in point is Problem 8, which covers twenty-five pages and deals largely with selling activities, and, despite the space devoted to the problem, important data on the nature of products are veiled in secrecy. Again, while twenty of the seventy-one problems deal with the selection of sources, none of them involves the much-disputed and important question of whether to buy from industrial distributors. Perhaps this grows out of still another and more important defect, namely, that the problems were chosen largely from big business enterprises where direct purchasing prevails.

The weaknesses of the volume in no way reflect upon the scholarly approach and research ability of its author. Perhaps they are inherent in the problem method of handling the subject, for, when compared to Professor Lewis' comprehensive volume on *Industrial Purchasing* published in 1934, the defects in the book under review become even more glaring. Nevertheless the book should prove of value as supplementary

material in giving the student of business a glimpse into some of the problems in purchasing faced by certain large concerns where functions are carefully differentiated.

THEODORE N. BECKMAN

Ohio State University

Bankruptcy in United States History. By CHARLES WARREN. Cambridge: Harvard University Press, 1935. Pp. vi+195. \$2.00.

The widespread reading of this latest product of the pen of the tireless Mr. Warren would almost certainly accomplish a great deal toward dispelling the curse of current fears that the shades of night are rapidly falling upon the existing economic and political order in the United States. The study, based in large part upon minute search of the records of congressional debates, makes beautifully clear the repetitive character not only of economic and financial depressions but also the repetitive character of the reactions of both public and private men to these economic spasms.

It is not too generally known that, prior to 1898, there were but some fifteen years in the history of the country, during which any national bankruptcy act was in force; and this in spite of the fact that nearly every session of Congress struggled valiantly with the problem. In the process of discussing the economic and political background of these facts Mr. Warren has neatly accomplished four major objectives: (1) He has shown clearly the relationship between periods of depression and the several movements for national bankruptcy legislation. (2) He has traced clearly for us the shift of emphasis from the viewpoint of the creditor to that of the debtor and a second shift to national interest in bankruptcy as a credit stabilizing device. (3) He has pointed out with precision the change in the character of objections to such legislation upon constitutional grounds and upon grounds of policy. (4) The book contains accurate and concise accounts of the insolvency laws which have been in effect from time to time in the several states, and it discusses the effectiveness of these laws as well as their legality upon constitutional grounds.

No student of the rise of our national institutions and no student of legal or economic history, whether lay or professional, can afford to

miss reading this attractive and authentic story of congressional legislation and attempts at bankruptcy legislation since the formation of the Union.

JAY FINLEY CHRIST

University of Chicago

A Study of Fluid Milk Prices. By JOHN M. CASSELS. Cambridge: Harvard University Press, 1937. Pp. 207 + Appendix and Bibliography. \$4.00.

This book is the product of an intelligent and comprehensive effort to explain the determination of fluid milk prices and their various relationships by reference to the classical theory of economics. Its greatest value lies in showing how extensively general price theory must be amplified and modified in detail to explain, or to forecast, actual price adjustments in fluid milk markets as now organized. Theoretical analyses of prices, supply, and demand dominate the work, but these are checked against actual conditions and results as revealed by a large mass of statistical data. Numerous footnotes indicating specific sources of data, together with an Appendix of voluminous tabular data, confirm the evidence of the text itself that the author has executed his task with unusual care. The discussions are generously illustrated by tables and charts, but the latter are somewhat lacking in clarity.

Among the propositions developed from the theoretical viewpoint the following are of special interest and significance:

1. Supply and demand are equated through the medium of price at three stages in the marketing process—at the point of sale by farmers in the country, at the point of purchase by dealers at their city plants, and at the point of sale by dealers to consumers. Offering prices by dealers at the city plants or at the farm are derived from the prices established in the consumers' market by deduction of charges for the various services supplied by dealers, transportation agencies, and the like.
2. The dealers' demand for fluid milk so derived necessarily is even less elastic than the original consumers' demand.
3. Responses on the supply side of the price equation are of three kinds, namely, production responses, marketing responses, and disposal responses. Marketing responses are defined as additions to or withdrawals from storage stocks, a matter of little consequence as regards a highly perishable product like fluid milk. By disposal responses is meant the choices exercised by producers in directing their milk to different markets or to different uses. Here, it would seem that altogether too little atten-

tion is given to the importance of disposal responses by dealers and other dairy plant operators, which under the conditions that prevail in some of the large fluid milk sheds is of far greater significance than the choices of market outlets by producers. Very often the latter are quite limited.

4. The fact that dealers' demand for milk for other uses is much more elastic than their demand for milk to be sold for consumption in fluid form provides a large opportunity for enhancement of price returns to farmers through the practice of discriminative pricing (i.e., use of class prices) on the part of collective bargaining organizations.

In chapters vi-xvi inclusive is presented a large amount of concisely summarized information of a factual nature pertinent to the business of marketing milk. Most of the data have been taken from published reports or other convenient sources, but the author has performed an important service in bringing these facts together and summarizing them, together with interpretations, which for the most part are accurate and helpful.

Outstanding among the factual data and discussions are those pertaining to (1) price plans used by producers' co-operative associations in selling milk to dealers; (2) differences in rates of milk consumption and the various factors related thereto; (3) geographical differences in the utilization of milk and in the production-consumption balance for fluid milk and manufactured dairy products in the "dairy and industrial area of the United States," particularly New England; (4) sources of supplies of milk, cream, and other dairy products for the principal markets in this "dairy and industrial area"; (5) the history of transportation services and rates for milk and cream in New England; (6) the competition between the New York and Boston markets for milk supplies originating in the marginal territory where their milk sheds join or overlap; (7) price premiums received by members of the dominant co-operative associations in ten important markets, over the competitive value of milk for use in manufacture.

The two chapters dealing respectively with "Dealers' Margins and the Chain Store Differentials" and "A Statistical Analysis of Production Responses" are decidedly weak. A major criticism of the production analysis is the author's complete failure to recognize that cycles in purchasing power and numbers of cattle probably have a profound, although as yet indefinitely measured, effect upon the supply of milk. The analysis of retail demand for milk also may be criticized for omission of any reference to the only continuous series of data accurately reflecting changes in the consumption of milk and cream over a long

period, namely, the monthly records of receipts of milk and cream at the New York market since 1885.

The combined theoretical and statistical analysis reaches a climax in the two chapters dealing with the measurement and interpretation of price premiums obtained by the producers' co-operative organizations over and above the competitive value of milk for use in the manufacture of butter. Comparisons between the average price returns (F.O.B. the market) to members of the principal co-operative associations of producers in the ten leading milk sheds reveals the following premiums over the calculated butter value of milk during the five-year period 1925-29.

	Per Cwt.		Per Cwt.
Hartford.....	\$1.31	New York.....	\$0.56
Baltimore.....	.95	Detroit.....	.56
Philadelphia.....	.84	Milwaukee.....	.51
Pittsburgh.....	.61	Chicago.....	.45
Boston.....	0.57	Minneapolis.....	0.36

The author asserts that extra costs of producing milk in accordance with the requirements of health authorities may account for premiums of from 20 to 30 cents per hundredweight over the value of milk for manufactured uses. The major part of the premiums, particularly with respect to the markets at the top of the list, is ascribed to "the success of the fluid milk marketing organizations in obtaining more favorable prices through effective collective bargaining and . . . to the policies of local protection adopted by state and municipal authorities." In the concluding chapter it is further stated that "the ranking of the markets [as to price premiums] is entirely consistent with what is known from various independent sources about the relative bargaining strengths of the different organizations operating in them."

A better illustration of the limitations of general price theory as a basis for interpreting actual prices and price relationships with respect to milk would be difficult to find. Obviously Dr. Cassels has attributed entirely too much in the way of price premiums to the bargaining power of the co-operatives.

In the first place, attention should be called to the fact that no price premium could have been obtained upon the milk sold by the producers in excess of the quantity utilized for consumption as fluid milk. This means that even higher premiums than those given in the foregoing were obtained upon the milk devoted to fluid use, particularly in such markets as New York and Minneapolis, where only approximately half the co-operative milk supplies were so utilized. Also, since the percent-

age of surplus milk in the Hartford market was very small while that in Minneapolis was very large, the difference in price premiums on the milk devoted to fluid use was much less than the difference in premiums based on total milk sold by the farmers.

A significant fact ignored by the author is that the ranking of the ten markets in respect to price premiums is closely correlated with their geographical arrangement. The three cities with highest premiums are situated in the densely populated region along the Atlantic seaboard, where milk output is insufficient to supply the full requirements of the markets of the region for milk and cream, not to mention the requirements for butter, cheese, and evaporated milk. In contrast to this, the cities with smallest premiums are situated in the midst of an intensive dairy region where output is much more than sufficient to fill the requirements of the regional markets for all dairy products. It happens, too, that the milk sheds of Hartford and Baltimore, whose price premiums are the highest, are most restricted by natural boundaries and by competition with other large markets near by. It is evident that the effects of both the natural limitations upon the supply of fluid milk available to the several markets and the different proportions utilized as fluid milk are reflected inadequately, if at all, in the theoretical basis upon which the author has calculated the "competitive prices that would tend to have been established for milk of manufacturing quality" in the several markets.

The assumption that substantial premiums have been obtained over a period of years by sheer force of bargaining power on the part of the co-operatives presupposes that for some reason increased and excessive supplies of milk for the market were not forthcoming in response to the higher prices; but it may seriously be doubted whether such limitations of supply as the co-operatives are known to have exercised or induced could have offset the "pull" of the prices so greatly enhanced by arbitrary means.

Finally, it may be suggested that the author's assumption that the price premiums in fluid milk markets were raised permanently to a much higher level with the advent of producers' organizations for collective bargaining is unwarranted. It is entirely possible that the higher premiums obtained during the approximate period 1917-30 are a phenomenon associated with the cattle cycle, which has a normal spread of thirteen to sixteen years from peak to peak.

LELAND SPENCER

New York State College of Agriculture

Principles of Marketing. By HENRY F. HOLTZCLAW. New York: Thomas Y. Crowell, 1935. Pp. 678. \$3.75.

This book, which presents an orthodox treatment of marketing principles, is written in an interesting and simple style. The method used by the author is largely descriptive; the material is well organized. Generous and, in the main, judicious use of the efforts of many other students of marketing has been made. A set of questions and problems, together with a selected annotated Bibliography, follows the chapters. The book contains a serviceable Index.

The first three chapters discuss briefly the general characteristics of marketing functions and channels of distribution, goods and their methods of sale, and the consumer and his buying motives. Eight chapters are used to describe the organization and operation of what may be termed marketing institutions. Three of these chapters are devoted to retailing; wholesaling is disposed of in two well-written chapters; a survey of co-operation among farmers and among retailers and consumers is presented in two chapters. The two following chapters discuss briefly the marketing of products, i.e., manufactured goods and raw materials. Eight chapters are apportioned to a discussion of marketing functions and market research. A discussion of commodity exchanges, prices, unfair competition, and marketing costs occupies the last four chapters of the book.

The author's discussion of standardization and simplification and of market research is, in this reviewer's opinion, more effective than some of the other chapters. Storage and refrigeration are relatively overemphasized. The relation of government to marketing is not given the emphasis that its importance demands. A discussion of the marketing of services is conspicuous by its absence. The reader is likely to get the impression that the author does not stress fundamental relationships in marketing organization, policies, and practices to the extent that they should be stressed in a book to be used as a text by undergraduate students.

J. F. PYLE

Marquette University

Reprinted for private circulation from
THE JOURNAL OF BUSINESS OF THE UNIVERSITY OF CHICAGO
Vol. X, No. 4, October, 1937
PRINTED IN THE U.S.A.

E. GROSVENOR PLOWMAN

MUNICIPAL WATER-UTILITY MANAGEMENT

Continued

E. GROSVENOR PLOWMAN*

MANAGEMENT AT THE CO-ORDINATION LEVEL

WHY A CO-ORDINATION LEVEL?

IF WE think of the public trustees as being always a committee, and the top executive as being always an individual, such generalizations will help to explain what is meant by the co-ordination level of management activity. The weaker the trusteeship activity, the less able it is to perform effectively, and the more the top executive resembles a general of an army, fully responsible and fully authorized. Conversely, strong activity at the trusteeship level shifts the top executive toward co-ordination activities. He serves as the eyes and ears of the trustees; he gives orders in the name of the trustees; he motivates the organization to achieve the objectives laid down by the trustees.

Thus, when the mayor of a city controls the city council, the power of the mayor is enhanced and that of the council reduced. A kind of dictatorship becomes possible under such circumstances. The mayor acquires great authority, at least with respect to the city employees and city departments.

Voluntary associations are commonly governed by an elected or self-appointed board of directors—a management committee. This committee, if the association is large, appoints an executive, commonly given the title of secretary. This executive secretary is responsible to the management committee; he is its representative, and may make decisions in its name, subject to blanket or specific authorizations; he is the eyes and ears of the committee; he motivates the association membership to work together along the lines laid down by the committee, usually lines formulated by himself but accepted and adopted by the committee.

* Professor of marketing and business research, University of Denver.

It is obvious that the secretary of a voluntary association cannot be a general, giving commands and enforcing obedience. He is essentially a co-ordinator, taking the ideas and wishes of the committee and translating them into action; taking to the committee the facts and wishes of their membership, for translation into objectives and policies by the committee. This does not mean that associations cannot have strong and forceful secretaries who do highly creative and original work. It does mean that when such forcefulness leads the secretary into the position of trying to force his committee or his membership to do what they are not yet ready to do, he and the association soon part company. If no other way is available, the membership melts silently away and the financial support disappears.

Because the mayor of a city has his own elected status, separate from the city council management committee, he can drift toward dictatorial control over the city employees and city departments, including the water utility. The city manager, on the other hand, is more like the secretary of a voluntary association. He is the creature of the management committee that appointed him. He derives much of his power as top executive from the management committee, in whose name he speaks. To get things done he must sell his ideas to the management committee. This does not keep him from being forceful, and a great leader and executive. However, like the secretary, he cannot become the general manager in the private business sense without running the risk of losing the support of his management committee and of the community.

This is even more true of the top executive appointed by a water board or a utility-district board, and serving at its pleasure. Such boards are highly specialized in their interest, as is the executive. This greatly increases the range within which the board can exert its powers without delegation. Such boards, in other words, are well equipped to perform the functions of trusteeship management, and, for that very reason, push their top executives toward the duties of co-ordination between top management and operation.

The term "co-ordination" is here used in the sense urged by Urwick, who has stated:

The additional co-ordination postulated by specialization and the technical authority which accompanies it [may evolve] a new type of official . . . [and] foreshadows a . . . true "staff" . . . in the military sense. . . . There must be a new kind of authority which is neither "line" . . . nor technical.¹²

To sum up, a co-ordination level of management activity is necessary in the case of the typical water utility because:

1. The top executive cannot, in general, assume personal power and responsibility, because such "general managership" type of power is incompatible with a strong and effective management committee at the trusteeship level.
2. Without a co-ordination level, there exists no means for bridging the gap between the trustees and the functional specialists and line executives of the operating organization.
3. The management committee, because of the personal limitations of practically unpaid part-time service, cannot personally study the records and reports of the organization, or personally translate general decisions into detailed instructions. The co-ordination level provides a means of assembly of matters for consideration by the management committee, and vice versa.

TYPICAL ORGANIZATION OF THE CO-ORDINATION LEVEL

The organization of the co-ordination level depends, of course, upon the point or points at which co-ordination of operation and trusteeship must take place. Thus, for many years official publications of the city and county of Denver have carried an organization chart. According to this chart there are two kinds of executives, those elected directly by the people and all others. In the elected class were the city councilmen, the mayor, and the city auditor. The chart indicates that the mayor is the executive head of all city activities, other than the city council and the city auditor. Followed literally, the Denver water utility would have no direct dealings with the city attorney, the city treasurer, the city auditor, or the city council, despite the charter amendment giving each of these agencies partial responsibility for water-utility matters. All co-ordination of the water utility with the

¹² L. Urwick, "Axioms of Organization," *Public Administration Magazine*, October, 1935, pp. 344-58, 385-92.

rest of the city government would be, under this plan, through the office of the mayor. With twenty-two distinct departments and agencies of the Denver city government, all heading up to the mayor, it is obvious that the mass of problems calling for co-ordination that would come to the mayor, if this chart were followed literally, would be enormous and far beyond the capacity of one executive to handle. To manage twenty-two separate agencies, large and small, is probably more than any one executive can successfully accomplish, yet that is the task to which the mayor of Denver presumably dedicates his attention. The lack of correspondence of this published organization chart with the actual facts needs no further comment. In fact, the co-ordination level in the Denver water utility has been partly in the person of the mayor and partly the responsibility of the top salaried executive of the water board—the secretary or manager.

According to a Detroit water-utility official statement, "Three officers in operating work report directly to the Board, to wit: The secretary, the auditor, and the superintendent and general manager. . . . The latter is the executive officer."¹³ This makes the general manager the chief co-ordinating executive, with two major assistants.

This Detroit pattern, of having several executives divide the major activities of the water utility, one such executive being also designed as chief co-ordinating or top executive, is very common. It is found at present in San Antonio, Des Moines, Louisville, and Cincinnati, for example. The actual activities thus identified as major departments are, of course, various. In Des Moines the departments are plant operation, handled by the chief executive; and finance and office management, handled together by another executive. In Louisville engineering and plant operation are under the manager; finance and office management have separate heads. In San Antonio plant operation is under the manager; there are both a secretary and an auditor. Cincinnati has office management, water supply, and water distribution, the latter two being the special interest of the water superintendent. Much of

¹³ G. H. Fenkell, *A Descriptive Survey* (Detroit: Board of Water Commissioners, October, 1928), p. 4.

the co-ordination level activity is, of course, transferred here to the Cincinnati city manager. A number of top executives of equal rank is found in the East Bay municipal utility district. The treasurer, attorney, secretary-accountant, and the chief engineer all report to the board. The latter is also designated as general manager, but this means chiefly with respect to plant operation, which itself consists of eight subexecutives reporting to him. This arrangement resembles the usual city organization, built up under the mayor and city council.

It is evidently common practice to build up an executive pyramid, much as in private business, headed by a single chief executive, who in most cases is also in direct charge of operation of the water plant. This chief executive is not a true general manager, although often so designated, but is rather a co-ordinator of operation and trusteeship levels.

In many cities the mayor is an essential part of the co-ordination organization. As has been pointed out, it is theoretically and practically possible for the mayor to be part of the trusteeship group; to serve as co-ordinator; and to arrogate to himself the rights and responsibilities of the general manager of a private business. There is no reason why the mayor's relation to the water utility, with respect to different problems, may not cast him in all three roles at the same time. Certainly, as far as the proprietary water utility owned by the municipality is concerned, the mayor's relationship should be simplified and clarified. The mayor cannot be all things to all men, even in management of the water utility.

PERSONNEL AT THE CO-ORDINATION LEVEL

The executive co-ordinating head of the water utility is usually an engineer, but this is not universal, a minority of the executives being recruited from the business-office side. This latter procedure develops especially where there is a strong board, served by an efficient secretary who is also office manager, and is then in line for promotion to the post of chief executive.

Of thirteen water utilities located in major metropolitan cities of the United States, seven include the word "manager" in the

title given to the top executive. Kansas City, having a city manager, calls its water utility head, who reports to the city manager, a "director." Baltimore has placed its water utility under the city engineer, who is appointed by and reports to the mayor. Under the city engineer is a water engineer. The water engineer has under him only plant operation. Billing and collection; accounting; finance; law; personnel; and even purchasing are under other subdivisions of the city, each with a top executive reporting to the mayor and city council. The principal co-ordination level is the mayor himself. The four remaining cities of the sample are divided. Two use the title "chief engineer and superintendent"; two use the title "superintendent."

It has already been pointed out that in water-board and utility-district cities, the co-ordination level tends to be concentrated directly under the board, which itself has tended to concentrate all trusteeship activities. It is further evidence of this tendency to find such cities, in the foregoing sample, giving to their top executive the title of "manager," perhaps in combination with other titles. The only exception is Louisville, which has carried forward the private-company designation of chief engineer and superintendent.

On the other hand, in mayor-council and city manager-council cities, the co-ordination level, in theory, should be the mayor or city manager, directly under the trusteeship level of the city council. Evidence of some tendency in this direction is found in use by such cities in the sample of the title superintendent or engineer, except Kansas City, which calls the water utility head a director.

Further proof is found in Table 1, contrasting the 1934 salaries of the top executive of the city and the top executive of the water utility. The six water-board and utility-district cities pay their top water-utility executive as much or more than the city as a whole pays the mayor or city manager. Where there is no water board or utility board, the water-utility head is brought into the executive pyramid, under the mayor or city manager as far as salary is concerned.

The question of the proper salary to pay the top executive of

the water utility has been much discussed. In many cities it is possible to show that the top executive of the predecessor private water utility, before purchase by the city, was paid as much as twice the salary now being paid by the city to its top water-utility executive. There is strong pressure against high executive pay for water-utility work. This is exerted by the mayor, the city council, and the heads of various city departments who argue with some justice that their work is also entitled to similar high com-

TABLE 1
COMPARISON OF SALARY OF CHIEF EXECUTIVE OF CITY
AND CHIEF EXECUTIVE OF WATER UTILITY

City	Mayor, Except as Noted	Water-Utility Executive
New York.....	\$40,000	\$15,000
Cincinnati.....	23,000 (city manager)	7,500
Dallas.....	13,200 (city manager)	4,400
Baltimore.....	12,000	8,500.
Fort Worth.....	10,000 (city manager)	4,800
Pasadena.....	9,000 (city manager)	6,600
Sacramento.....	9,000 (city manager)	5,400
Washington.....	9,000 (commissioner)	5,800
Oklahoma City.....	8,000 (city manager)	4,000
El Paso.....	5,000.	3,850.
Los Angeles.....	10,000	18,000 (water board)
San Francisco.....	10,000	12,000 (utility commission)
Oakland.....	10,000 (city manager)	10,626 (utility district)
Denver.....	6,000	6,000 (water board)
Louisville.....	5,000	5,000 (water board)
Des Moines.....	4,500	5,000 (water board)

pensation. This is the "executive pyramid" point of view, classifying all pay up to the mayor or city manager. There is also very strong public pressure against high executive salaries. In the public mind, the predecessor water company was paying excessively for its executive services. To the public, the modest salaries of Table 1 look high.

The water-utility executive's case for substantially higher pay would be stronger if his duties more closely resembled those of the predecessor general manager or president of the private water utility. As has been pointed out, the application of the term "manager," even in cities with strong water boards and utility boards, does not make the top executive of the water utility a

"manager" in the private-business sense. He is clothed with a different kind of authority, which has been called here (with Urwick) the authority to co-ordinate. It may well be that this type of authority will customarily command a lower salary than is paid for the ability to command in the general management sense. The difference is in the degree of delegation of authority by the management committee. The board of directors of a private business will commonly delegate to their general manager the maximum possible authority, and exact from him maximum possible personal responsibility for success or failure. The board of trustees of a public business, on the other hand, tends to delegate the minimum personal authority and responsibility to their top executive. Everything, as far as possible, is determined on the basis of custom, law, regulation, or motion passed by the board to meet the specific case.

Another reason for relatively lower salary of the top executive as compared to private water utilities is the practice of promotion from within. Like other municipal undertakings, management is recruited either from within the organization or from within the city. The latter is little different from the former in producing executives of local experience, therefore of local earning power. The typical top executive of the water utility may be described as an engineer, usually with university training, with knowledge of the water utility that approaches perfection, with little or no background of outside experience. Even though his ability as an executive might justify much higher pay, he has no bargaining power.

It must not be forgotten that the top water-utility executive sometimes is in a favored position, from the standpoint of having life-employment under civil-service rules. He can and does place a high valuation on such guaranties, as compared to the relatively greater insecurity of executive employment in private business.

THE EFFECT OF "LEGAL FUNCTIONALIZATION" UPON CO-ORDINATION

What may be called a "legal functionalization" is characteristic of most city governments, and therefore of most water

utilities. By this is meant the practice of the city charter of defining in exact legal language certain functional duties to be performed by various officers of the city, such as the attorney, the auditor, the treasurer, the purchasing agent, the civil-service commission, and the water board. Often these functional assignments are overlapping and conflicting, as when a water board is told in its charter that it is responsible for management of the water utility; but, it is added, all purchases must be made through the city purchasing agent, all legal counsel must be obtained from the city attorney, and so forth. Legal functionalization has the following characteristic effects upon organization.

1. Legal functionalization leads inevitably to duplication of work. Thus, in Denver, the water-utility organization and the city auditor's office are both responsible for accounting. The result is more or less perfectly co-ordinated parallel books. Duplication is present not only in the books themselves, both sets of which must be posted from original records; but also in the time spent in reconciling the two sets of books and adding explanations of minor differences resulting from slight variations in posting.

2. Legal functionalization makes the organization "divided responsibility" minded. "Divided responsibility" may be thought of as existing either because of the checks-and-balances theory of the Constitution, or because of the principle of double control used throughout accounting. In practice the latter reason is more important than the former, though the attorneys drafting the city charter doubtless had the former in mind. Thus, in the Detroit water utility, a check drawn by the water utility in payment for services must be "audited" by another portion of the city government before payment. This means that the proposed payment must look reasonable and honest, and must have its proper accounting classification so that it may be posted against the proper item of the budget. The check, having run this gauntlet, may then be deposited for payment, but it is still only a warrant until redeemed out of water funds by the city treasurer, a third arm of the city government.

3. Legal functionalization automatically shifts the management emphasis from leadership to co-ordination. Thus, a ques-

tion arising between an accounting employee in the water utility and his "paired" accounting associate in the city auditor's office results in an appeal to the water-utility top executive on the one side and to the city auditor on the other side. The result of this appeal is either a "jurisdictional dispute" concerning the right to make the final decision, or a solution arrived at by agreement or compromise. In such a case there may exist no machinery for final settlement. The city auditor, with his mandate direct from the people by one route, may be in controversy with the water board through its executive. The water board also has its mandate direct from the people by another route. There is no management agency competent to direct the two independent arms of the city government in such a way as to arrive at a solution. As Urwick has forcefully stated, "Whitehall . . . is still a tiltyard where desperate assaults-at-arms are engaged over points of interdepartmental competence of no interest whatever to the public."¹⁴

4. Legal functionalization overemphasizes the functional method of organization of departments and subdepartments. Thus, in Denver, there has been intermittent discussion between the water board and the city attorney over the meaning of the charter provision requiring the city attorney to provide the board with all of its legal service. The question has been as to what is the scope of the legal function or activity. For example, in the settlement of claims, does the legal function include negotiating the cash consideration that is to pass? If the water board has agreed upon the terms of a contract, what is the proper scope of the city attorney's duties with respect to modification of its terms in drawing up the official papers for signature? If the water board has made an agreement, is it binding even though it was not drawn up by the city attorney? In dealing with its customers, can the water board permit its employees to handle refunds and settle claims and disputes by an administrative process without passing such matters through the attorney's office? The answer to all such questions is, of course, to disregard the broad implications of the "legal function" and to decide whether or not the particular problem is or is

¹⁴ Urwick, *op. cit.*, p. 355.

not customarily handled by an attorney. The actual division of duties is a problem in co-ordination, not of instructions issued by some still higher authority.

There can be effective organization of departments and sub-departments within the water utility only through recognition of the requirements of legal functionalization in the particular case. This may well lead to overfunctionalization from the standpoint of efficiency, but it does mesh the organization in with the rest of the city government.

5. Legal functionalization which results in two agencies having joint responsibility, such as a water utility and the city treasurer both responsible for the water fund, leads to a "line of decisions" concerning questions arising from time to time of jurisdictional character. Since the solution of such problems must always be a decision giving one of the two agencies the right and duty of making the final decision in the particular case, the result of the line of decisions is to make one of the two agencies a mere rubber stamp. Thus, in the case of water utility and city treasurer, the water utility may rubber-stamp the treasurer's investment of water funds in sinking-fund reserves, or his deposit of funds in banks of his own choice. The city treasurer, on the other hand, may rubber-stamp the water board's expenditure of funds for construction, whose diversion from debt service will result in financial difficulties at a later date.

It should not be thought that "legal functionalization" is the only force making for multiplication of the number of departments and subdepartments within the water utility. An important motivation is derived from the system of classifications of pay, commensurate with rank. Since it is believed by most water-utility executives that they are underpaid, there is constant pressure to increase the number of subexecutives entitled to the highest rating for pay purposes under the chief executive. Functionalization of additional departments, split out of the older departments, is a convenient device. This is often true, for example, of the chief chemist, who is given the functional position of head of the laboratory department in order to place his rating for pay purposes at the highest possible level.

Another motivation is public dislike of the "vice-president" concept of organization. The public likes to think of its water-utility chief executive as a personal type of manager, out on the job in shirt sleeves. It does not take kindly to the notion of the chief executive dealing directly only with a few subexecutives of "vice-president" type. Hence the chief executive is encouraged to increase the number of subexecutives reporting directly to him. Thus, in Baltimore, the water utility consists of six subdivisions reporting to the water engineer: filtration, service, pumping, engineering, construction, and maintenance. The general manager of the East Bay utility district has reporting to him eight subexecutives, covering service; water engineering; mechanical and electrical engineering; water distribution; aqueduct maintenance and operation; land transactions; personnel; and purchasing. In Denver there are six such subexecutives reporting to the chief executive: service; accounting and collection; inspection; purchasing and personnel; construction; and engineering and operation.

Still another force working in the same direction is the expansion of activities of the water utility. Among the extra duties that have been added to typical water utilities under various conditions are the following:

1. Los Angeles, San Francisco, and East Bay water utilities use part of their system of dams, reservoirs, and canals for the generation of electricity.

2. Large ownership of land for watershed control purposes has emphasized the ordinarily unimportant function of landlordship in the cases of Denver, Los Angeles, San Francisco, and East Bay. The San Francisco water utility has many agricultural tenants and, in addition, operates a large walnut orchard.

3. San Diego, Salt Lake, Dallas, and Fort Worth supervise limited use of watershed lakes for recreational purposes. Des Moines, St. Louis, Baltimore, Detroit, and New York operate parks; Louisville and Erie water utilities operate municipal swimming pools.

4. Sacramento and Baltimore manufacture their own alum for filtration purposes. St. Louis, Cincinnati, and San Francisco oper-

ate short-line railroads; Los Angeles and Denver maintain public highways; Denver operates irrigation canals; Dallas, Fort Worth, Oklahoma City, New Orleans, New York, and Los Angeles operate sewage disposal plants.

This list is not intended to be exhaustive, but merely to indicate the types of additional activities growing out of increasing size and spreading range of duties. It is a strong reason for the increase in the number of departments into which the work of the water utility is divided under the chief executive. This increase in departmentation, also largely of functional character, fits in with the basic legal functionalization already discussed. To increase the number of executives reporting to the chief executive, whether for legal functionalization or expansion reasons, increases the co-ordination problem and the co-ordination responsibility of the chief executive.

THE COMMITTEE OF EXECUTIVES AS A CO-ORDINATION DEVICE

Much can be said against the use of the management committee from the standpoint of its high cost of operation; its irregular contact with problems because of its intervals between meetings; its tendency to reverse itself. It is not the province of this study to analyze these defects in detail, but rather to deal with the basic fact that the typical water utility in the United States is controlled, at the trusteeship level, by a management committee. The problem is what to do about it, in order to develop effective management from top to bottom of the organization through the various levels of management activity.

The discussion to this point has brought out the importance of clear-cut lines of demarcation between the field of management activity of the trustees, or management committee, and the field of activity of the top executive, or co-ordinator. It has been urged that the ability to manage of the trustee committee is, in general, great, but that this ability to manage is confined to the trustee committee as a whole and operating as a group. Individual trustees cannot function as executives without confusion and the sense of interference. On the other hand, the top executive cannot be a general manager in the sense of ability to issue "line" instructions

and commands that must be followed, willy-nilly. The top executive is primarily a co-ordinator, deriving his power from his position as representative of the management committee, spending much of his time in co-ordinating management committee and organization.

The problem of successful conduct of meetings of the water board is one of the constant cares of the top executive. If meetings are not successfully conducted, the business of the water utility will be held up. The resulting confusion will add to the burden of the top executive and be charged to his neglect. The essentials for successful conduct of water-board meetings are a planned agenda; a system of presentation of water-utility problems to the water board in sufficient detail and in a manner to permit formation of judgment by the members; suggestions concerning the proper action of the water board on each problem; a legal record of the formal actions of the water board.

Evolution of board-meeting conduct in Denver has led to the device of the committee of executives, consisting of the top executive plus the six subexecutives who head the operating departments. The plan of procedure that has developed is as follows:

1. The committee of executives holds a lengthy session four or five days in advance of the regularly scheduled meeting of the water board. The purpose of this meeting is to prepare the agenda for the coming meeting of the board. This means that each executive in turn presents to the committee those problems he wishes to have passed on by the water board. Some of these problems never reach the board itself. The committee and the top executive are often able to solve the problem, especially if the question involves internal co-ordination between different subexecutives. The work of the committee, therefore, sorts out the problems of the current time period, solves those that can be solved without going higher, and thus produces an agenda less likely to be unnecessarily loaded with minor and inconsequential matters.

2. Each of the items proposed for the agenda, having been scrutinized and accepted for presentation, is then assigned to one or more of the committee members, and through them to their subordinates, for preparation of a written résumé of the problem,

recommendations for action, and justification. The length of such a written statement, of course, varies with the importance of the problem, the familiarity of the members of the water board with the problem (which may or may not have come up before), and the adequacy of available data concerning the problem.

3. Twenty-four hours before the scheduled meeting of the water board, each board member receives a folder containing a copy of the proposed agenda, plus copies of all the written statements that will be presented at the meeting. Experience has shown that the board members do go to the trouble of becoming familiar with the contents of this folder before the meeting. From their standpoint this procedure saves time, forces the executive to defend his position with facts presented in writing, and permits reflection by the board member before the meeting.

4. The board meeting takes up each item of the agenda, the membership of the executive committee being present to answer questions. In practice, the water board rarely takes time to re-read the entire written statement. Instead, the time of the meeting is devoted to asking questions which lead either to action by the board, to dropping the matter as not requiring action, or to returning the problem for further study and subsequent report—often, in the latter case, in appointing a committee of the board to guide the next steps, or, through power to act, to make the necessary decision.

With two water-board meetings required by the charter each month, the cost of preparation for meetings, plus attendance at the meetings, plus the payment to the board members (\$25.00 per meeting for five members) is not less than \$1,000 per month. This may be said to be the extra cost of having a plural executive at the trusteeship level, as far as Denver is concerned. This, however, would be an overestimate, because much of the report-writing, conferring, and discussion would take place under any management plan. It is also true that this method of operation of board meetings has saved its cost many times over in reduction of confusion and improvement in ability of the water board to come to intelligent and economical conclusions. From the standpoint of the chief co-ordinating executive of the water utility, the com-

mittee of executives is an indispensable part of the machinery of co-ordination. Through it, and through its contacts with the water board, much co-ordination simply happens in natural fashion; more difficult problems are properly identified and can be segregated for more complete study and report to the water board; and the board is educated more completely concerning the problems of the water utility, thus lessening the chance of irresponsible decision on its part.

THE "LIMITS OF DISCRETION" OF THE CO-ORDINATOR EXECUTIVE

Every executive is free to operate within certain more or less accurately established limits of discretion. One of the earmarks of the co-ordinator type of top executive is that he must operate within carefully established and narrow limits of discretion. This is not only true of the top executive in the water utility, but of all subexecutives. The principal ways in which the limits of executive discretion are defined and narrowed for the top executive of the water utility are as follows:

1. Discretion is greatly limited by the laws, ordinances, and motions (actions of the state legislature, the city council or the water board) which affect the operation of the business. Among the field of business activity in which freedom of executive discretion is great in private business, but in which discretion has been limited by passage of detailed laws or ordinances in the case of the water utility, are pay of employees, employment and retention of employees, procedure of purchasing, procedure of selling junk or used equipment or unneeded property, procedure of making and enforcing the budget, procedure of depositing and paying out money.

2. It is a common practice in water-utility management to permit executive discretion to be exercised within certain limits by blanket authorization passed by the management committee. Thus, in Denver, the top executive was empowered to approve purchases of less than \$1,000; was permitted to employ temporary workers on per-diem pay; was allowed to settle claims or approve refunds of less than \$50; could authorize temporary transfers,

even of executives, and could grant "trial" promotions without increase in pay subject to final approval by the water board. He could not buy a new automobile for the water utility, even though its cost was less than \$1,000; he could not employ executives without board approval, even on the per-diem plan for short periods of time; and employment of special consulting experts was of course the sole responsibility of the water board. Limitations such as these are far more sweeping than limits of discretion placed upon the private-business executive.

3. In addition to the real limitations of laws and actual voted limited authorizations, there is the great class of intangible, psychological limitations that exist only in the mind of the executive. The careful top executive of a water utility will take up many problems with the water board before they are decided, on the off-chance that some member or members of the board will have some decided objection to the proposal. This brings into the realm of actual limitation the whole field of engineering and construction. Thus, a change in fuel is clearly a matter for the water board to consider, because abandonment of coal in favor of electricity, for example, is sure to bring a protest to one or more members of the board from interested and influential dealers in coal. Similarly, an irate citizen is often permitted to appeal his case, no matter how positively the water board has ruled on similar cases, on the theory that the citizen will never be satisfied until he has had his "day in court" with the water board itself.

When one considers that metropolitan city water utilities are among the large businesses of their respective communities, the rigidity and narrowness of the limitations within which the top executive of the utility finds himself can be better appraised. The Denver water utility, for example, during recent years has had a working force of 450, a capital investment of over \$30,000,000, a plant having fifteen major operating points scattered in a long line more than 100 miles up into the mountain watershed, and an annual income of \$2,500,000. The work of top management of this moderately large business is a problem in co-ordination, achieving the necessary results by skilful use of the extremely narrow range of executive discretion.

The rigidity of this whole structure of governmental limitations upon executive discretion does not lend itself well to the handling of emergencies. To cope with this difficulty the Los Angeles water utility, along with other agencies of the city government, has been created a special emergency district to operate only in event of disastrous earthquake. The chief executive of the water utility, part of this earthquake organization, is thus empowered to cut through all red tape—to be the general-in-command for the period of the emergency. The authority includes the right to issue a limited sum of city warrants if no other means of obtaining the needed supplies is at hand.

The mistake of thinking that the narrow limits of discretion available to the co-ordinator-type executive proves that such an executive is weak and ineffective should not be made. To operate a water utility successfully under the typical municipal management committee of city council or water board requires thorough understanding of such matters as the exact limits of discretion, and, in a sense, requires more skill because of the very existence of such narrow limitations.

SUMMARY

In municipal water utilities the top level of management, under the management committee, is necessarily a co-ordination level because the general management type of activity is incompatible with a strong management committee of trusteeship type, and because the trustees cannot bridge the gap between themselves and the operation of the water utility in any personal manner. Water-utility executives, in practice, are better fitted by experience and training for the co-ordination type of executive activities than for general management.

A trend that emphasizes the need for co-ordination at the top management level is the increase in the number of subexecutives in the water utility, each in charge of a department. This trend has resulted partly because of legal functionalization requirements, written into the charter. It is partly the result also of the increase in scope of activities of the water utility and the desire to increase the number of subexecutives drawing maximum pay.

Proof of the great importance of effective co-ordination at the top management level is found in the success of the committee of executives as a co-ordinating device. Through such a committee, in addition to internal co-ordination, it has been possible to organize the work of the water board more effectively.

The authority of the top executive or co-ordinator in the water utility is circumscribed. Limits of discretion of the top executive have been established by means of laws, ordinances, and specific motions; and also by means of narrow limits of permissible discretion incorporated in blanket authorizations. In addition there exist many and important psychological limitations in the mind of the executive. Even the degree of freedom to cope with emergency is sometimes laid out by statute beforehand. This clothes the top executive of the water utility with a different type of authority from either line or functional—a type that may well be called “co-ordination authority.”

[To be continued]

MUNICIPAL WATER-UTILITY MANAGEMENT

Concluded

E. GROSVENOR PLOWMAN*

MANAGEMENT AT THE OPERATION LEVEL

DEPARTMENTATION IN GENERAL

THE actual departmentation of the water utility tends strongly toward the functional, except at the very lowest level of subdepartmentation, where the geographical dispersion of operating centers results in territorial control. There is, of course, some difference between the theoretical spread of a particular function and the actual spread of duties. There may be noted, however, a strong tendency to broaden the functional department's scope to include a larger percentage of the theoretical operation, as, for example:

1. The meaning of the term "purchasing," in a functional sense, is inclusive of all acts of purchase, both goods and services. In Denver, for example, even the services of temporary specialists are purchased through the purchasing agent. In some cities it is necessary to advertise for bids from such specialists just as if their services were a tangible commodity.

2. Engineering records, design of structures, inspection during construction, and approval after construction have been almost completely concentrated under the chief engineer in many water utilities.

3. Laboratory responsibility for water purity has, in recent years, been extended to the purification of newly constructed water mains before they are placed in service.

4. Control of the automobile fleet, its repair, housing, and allocation centralizes the function of transportation.

5. There is a tendency toward electrical and mechanical specialists—sometimes the same person—responsible for all electric wiring and mechanical equipment.

* Professor of marketing and business research, University of Denver.

6. Some water utilities, under their own civil service, have gone far toward a separate functional personnel department.

A detailed summary of the actual departmentation of typical water utilities bringing out clearly the tendency toward as complete a functional organization as possible is shown in Table 1.

The indentation in the summary indicates grouping of functional activities into administrative divisions or major departments. The term "independent" means that the office may exist but has no responsibility over the water utility.

These four water utilities are fairly typical of the major forms of organization under the council and mayor, under the water board, and under the utility board. Organization under the council and city manager is not shown. It resembles the council and mayor plan in its use of city departments as part of the water utility.

The major departmentation is very much alike, aside from the shifting of responsibility for top management. Baltimore has seven departments heading up under the city, and six heading up under the water engineer—a total of thirteen. Detroit has five departments heading up under the city, and five heading up under the general manager—a total of ten. Denver has five departments heading up under the city, and eight departments heading up under the executive assistant to the water board—a total of thirteen. East Bay has four departments having independent direct contact with the utility board, and eight departments heading up under the general manager—a total of twelve.

Disregarding the varied arrangements of functions into major departments, the summary indicates that the following functions are given more or less complete and separate recognition in all four of these water utilities: legal, handling of money and its safekeeping, auditing, civil service and/or personnel, purchasing, major construction, accounting, billing and collecting, customer service, minor construction, maintenance, engineering, filtration, purification, pumping—a total of fifteen functional activities covering the whole range of water-utility work.

The summary also indicates general agreement that the functions of legal advice and litigation, handling of money and its

TABLE 1

DEPARTMENTATION OF TYPICAL WATER UTILITIES

Baltimore	Detroit	Denver	East Bay (Oakland)
Organization of the Trusteeship Level of Management Activity			
City council Civil service commission Mayor	City council Civil service commission Mayor Water board	City council Civil service commission Mayor Water board	(Independent) (Independent) (Independent) Utility board
Organization of the Co-ordination Level of Top Executive			
Mayor City engineer Water engineer	Mayor (Independent) General manager	Mayor (Independent) Executive assistant	(Independent) (Independent) General manager
Departmentation Independent of the Water-Utility Top Executive			
Legal Treasurer Auditing Civil service Purchasing Major construction Accounting, including billing and collecting	Legal Treasurer Auditing Civil service Purchasing	Legal Treasurer Auditing Civil service Major construction	Legal Treasurer Auditing Accounting, including billing and collecting
Departmentation under the Water-Utility Top Executive			
Customer service	Personnel Major construction Business accounts and records	Personnel Purchasing Accounting, including billing and collecting Customer service Flat-rate inspection	Personnel Purchasing Major construction Customer service
Minor construction Maintenance Engineering Filtration and purification Pumping	Minor construction, maintenance and engineering Purification and pumping	Minor construction Maintenance, engineering, filtration, purification, pumping, conduits and reservoirs Water-rights administration	Minor construction, maintenance, filtration, purification and pumping General engineering Aqueduct maintenance and operation Land management

safekeeping, auditing, which may mean either the typical pre-audit of governmental agencies or the C.P.A. audit, or both, and civil service are kept independent of the general manager. In all four cases these functions are part of the direct province of the trusteeship level of management activity. This is because of their special nature. The legal function directly affects policies and strategy by means of which the trustees aim to accomplish their objectives. The treasurer and the auditor are properly independent because they check each other and operating management. The civil-service function involves the administration of a specialized protective law, and the law itself, by creating a civil-service commission, prevents delegation below the trusteeship level.

Operating functions, on the other hand, are defined by all four water utilities as being personnel, customer service, minor construction, maintenance, engineering, filtration, purification, and pumping. The difference between civil service and personnel will be discussed in the chapter on personnel. Customer service is a catchall function covering such matters as new connections with the mains, complaints and misunderstandings, turnoff and turn-on. There can be no doubt that it is an operating function.

Minor construction, maintenance, engineering, filtration, purification, and pumping constitute the group within which the subdepartmental level of organization along territorial lines takes place. Table 2 shows the actual organization of these functional activities in Denver.

Below this subdepartment level, at the level of foremanship and group supervision, the use of the territorial method of organization is even more common. This is because of the relatively large number of separate operating centers of permanent or temporary character. As a result, such a territorial-type foreman often finds himself supervised by several different functional specialists. Thus the foreman of one of the city pipe crews, for example, may receive an order to instal a particular pipe at a certain location. The specific measurements come from the engineering division, which also acts as inspector and checks the final measurements for preparation of its pipe maps; the pipe itself is delivered by the storage yard with its own truck and crew, giving

the foreman contact with another supervision center; and the pipe when installed is disinfected and flushed under the direction of the laboratory. Back of the orders of the engineering department are promises made by the customer-service division to instal such a pipe. The records indicating installation must go not only to the engineering division but also back to the customer-service division and to the billing and collection division.

TABLE 2
TYPICAL SUBDEPARTMENTATION, DENVER WATER UTILITY

Manager of Construction	Chief Engineer and General Superintendent
Auto transportation, including repair	All engineering, except major construction
All building, construction and maintenance	All filtration and purification Street mains and valves, maintenance and operation Pumping Electric wiring and equipment
Territorial	
Central storage, garage and shops area, including shop services	Reservoir 1 Reservoir 2 Reservoir 3 Conduits maintenance and operation outside city Conduits maintenance and operation inside city

The principal functions of departmental character that sometimes are placed directly under the trusteeship level, and sometimes placed under the top executive of the water utility, are purchasing, major construction, and accounting—including billing and collection. In the four water utilities compared these functional departments are equally divided between the two.

The argument in favor of using the purchasing organization of the general city government is, of course, the function viewed from the standpoint of the entire city. It is pointed out that the purchases of the water utility, added to those of the city, will provide even larger volume with which to bargain for quantity dis-

counts, will permit reduction in varieties of articles purchased, thus permitting mass production and reduction in the city's investment in inventory, and will permit more intelligent and detailed study of sources of supply and of qualities offered as compared with specifications. Against these forceful arguments there is presented by the water utility the claim that the variation between typical city and typical water-utility purchases is so great as to reduce the possible economies of consolidated buying, that emergency needs require carrying of an inventory directly under the control of the water utility, eliminating possible savings through reduction in total inventory, and that sources of supply for water-utility materials commonly charge more, that is, offer a lesser discount to the purchasing agents of cities than to the purchasing agents of water utilities.

Major construction is apparently also evenly divided. Actually the trend is strongly toward complete separation of this functional activity. In Detroit the major construction indicated in Table 1 was being carried on by an almost completely separate organization—even to having its own accounting organization—specialized in the accounting problems incident to bond funds and large numbers of temporary workers. In East Bay the chief engineer and general manager was selected in part because of his ability in handling major construction. His responsibility was for design and inspection, the work itself being contracted.

Much the same can be said of accounting, including billing and collection. Although apparently evenly divided in the sample of four water utilities studied in detail, there is, even in Detroit and Denver, pressure exerted by the charter relations with the city auditing and accounting department that makes for independence. In Denver the judgment of an outside accounting expert was that better organization would be obtained and fewer functional difficulties would appear if this independence were even further recognized. He urged that differences of opinion between the head of the accounting department and the top executive be arbitrated by the water board itself—this would automatically grant autonomy to the accounting function and place it directly under the water board.

OBJECTIVES AND POLICIES

The objective of a water utility is to render a satisfactory water service to the individual citizens of a particular community. For generations the typical metropolitan water utility has been swamped with the problem of its own expansion to keep up with rapid population growth—rapid expansion of the geographical area within which it was supposed to render service and rapid increase in the variety and amount of service rendered per capita. This led to the strategy of concentrating available funds and available personnel upon the task of physical expansion of the water utility, leaving the office to lag behind with little attention.

Now that population growth has begun to slow down, water utilities have been enabled to catch their breath and to view their problems more broadly. The result is a new point of view which may be called the strategy of performance of all necessary services at the optimum balance between cost and value to the citizen-customers.

Some water utilities have much more stable and effective management committees than others. The natural trend of any plural executive under the pressure of reality would seem to be toward proper fulfilment of direct obligations, and proper delegation of responsibilities and duties to others. The experience in the case of the Denver water board, for example, has been away from inexperience and instability, toward experience, stability, and effectiveness. The principal effects of the degree of stability of the trusteeship committee upon operation are, from observation of several cases, apparently as follows:

1. Under conditions of instability of the trusteeship committee, policies, once established, are not persevered in unless of extremely basic character, such as working toward a new water-supply source under the incentive of recurring water shortages. The reverse, of course, develops along with the trend toward stability of the management committee.

2. Similarly, under conditions of instability of the committee, delegation of authority is notably restricted, erratic, and is often granted for temporary periods and then suddenly withdrawn. The trusteeship committee, in other words, contributes markedly

to its own instability by overloading itself with the minute details of management. Everything must come before it. Again the converse is true as stability develops—the board under such circumstances conferring a similar sense of stability upon its executives by well-defined and reasonable delegation of the fullest possible measure of the authority that has already been defined as of “co-ordination” type.

3. There seems to be a strong trend, under conditions both of stability and of instability of the trusteeship committee, to move toward more use of force account, shops, maintenance, and construction—in other words, toward greater self-containment. The arguments of better use of the worker’s time, lower costs through not having to pay a profit to outsiders, and advantages of larger equipment in meeting emergencies seem to appeal to all types of trusteeship committees.

In private business the profit motive is thought of as the dominant objective to which all others can be related. In public business the objective commonly accepted is satisfactory service. All policies can ultimately be related to this objective. However, as in private business, there are many objectives which are the immediate cause for a particular action, each with its own relation to the service motive. The following outline, based upon particular study of the operating policies actually followed in recent years by Detroit, Denver, East Bay, and San Francisco water utilities, indicates the nature of these subobjectives as well as the policies handed down to the operating executives from the trusteeship committee and the co-ordination executive evolved out of these objectives.

Desire to provide for future enormous population growth.—Such belief was general among water-utility executives until the recent depression plus the new knowledge of declining net birth-rates began to take effect. It has resulted in water-utility construction of large overcapacity in terms of present consumption rates in new lake intakes, new river water supplies obtained by means of long aqueducts, new and enlarged pumping stations, and laying of large trunk mains, especially into suburban areas.

Desire to develop and maintain good public relations.—This has resulted in reducing water rates to protesting classes of customers; reducing taxes instead of water rates in some cases where tax levy is part of the water-utility income; eliminating harmless tastes and odors, even at large expense; eliminating poor pressure districts; liberalizing the main extension policy; assuming responsibility for the “service pipe” under the pavement; paying banks and stores to act as neighborhood collection agencies; sending collectors to the homes of customers as a monthly courtesy routine; offering a discount for prompt payment instead of a penalty for delay; treating delinquents, including charity cases, courteously; using the power to shut off water only as a last resort; establishing a central complaint division; encouraging public visiting of places of interest owned by the water utility and providing park and recreational facilities at such places; using literature distributed with bills, as well as movies and advertisements for good-will purposes; training employees in courtesy and service; purchasing all possible supplies through local concerns; distributing purchases by rotation or by lot among equally available dealers; purchasing insurance through the local association for allotment to all alike; avoiding force-account “competition” with local business houses capable of rendering the service desired; obtaining and making public an annual certified public-accounting audit; and submitting the proposed annual budget to such an agency as the local chamber of commerce before adoption.

Desire to get along with the municipal government.—This has resulted in failing to collect for water service rendered to the city government; co-operating in emergency relief projects, though this diverted available water-utility funds toward secondary rather than primary construction needs; avoiding an open issue with the health authorities over the right to turn off water in occupied premises in order to force payment of delinquent bills; improving the fire protection offered by the water system; assuming redemption and interest cost on long-time debt of the water utility; rendering of many petty services to various branches of the city government, usually without charge; collecting a sewage-disposal charge by inclusion on the water bill;

assuming the cost and obligation of operation of the sewage-disposal plant for the city.

Desire to provide steady employment and good employee relations.—This has resulted in transferring displaced employees to a "labor pool" for reassignment, the labor pool being given some work each month; providing "fill-in" work for repair and maintenance forces to permit employment on full time; providing liberal plans for compensation in event of accident, illness, old age, or death; continuing employment of "working" pensioners where no pension plan exists; developing classifications of salary grades; providing for more or less automatic service promotions; recognizing seniority rights in promotion and layoff; encouraging employee organization for collective bargaining, credit union, and other purposes.

Desire to improve operating conditions.—This has resulted in replacing short-lived by much more durable materials in structures and equipment; systematic planning of the proper size of pipe to lay in a particular street in terms of the future gridiron; constructing duplicate facilities at keypoints for stand-by protection; providing complete, detailed system drawings for all employees required to do emergency work; systematic following-up of fires, and systematic checking of street valves and fire hydrants; eliminating all unprotected cross-connections with other water supply; providing strict laboratory control of water purification; chlorinating newly laid mains before they go into service; providing twenty-four-hour emergency service for main break repairs.

Desire for economy—This has resulted in substituting power operation for hand operation of large valves; planning maintenance of structures and equipment rather than scattered repairs; attempting to reduce the accident cost incident to operation and construction; holding material sellers and contractors to the performance and results guaranteed by them or demanded in the specifications; constant inspection and maintenance of meters to keep them registering the highest possible percentage of water passed through them; sorting and sale of salvage; study of materials to obtain the best possible combination of first cost, instal-

lation cost, and maintenance cost; methodical water-leakage surveys and methodical cleaning of mains, to reduce pumping and filtration costs; use of mechanized billing and accounting procedures; design of rate structures and customer rules for minimum office cost.

This summary is noteworthy for its slight emphasis upon selling. In fact, almost no water utility makes any effort to sell its services at all. It is taken for granted that he who wants water service will come to the office and demand it.

The general service objective is motivated by much more than the desire for operating economy. The economy motive is far less effective in causing actual action than almost any other subobjective. This is not because the water utility does not desire economy, but because the problem usually appears before the water board and its executives with some other phase commanding the major emphasis. The tendency is to submerge the economy motive under the argument of "paramount necessity" for population growth, good will, or some other reason. Economy has few champions before the board other than the operating executives, and they often are unwilling to experiment, desiring to leave well enough alone.

The theory, based upon admittedly limited observation, is hazarded that the less stable and less effective the trusteeship committee, the farther down within the operating organization tends to be concealed the true responsibility for polity. By this is meant that the operating executives, trying to work under an unstable board, tend to avoid and evade carrying problems up to the water board for solution. In a large organization there is usually sufficient precedent for an action to make its repetition possible without its becoming an issue of importance to the management committee. This puts the unstable management committee in a curious and ineffective position. On the one hand, it orders that all details of some specific character come before it. For example, in Denver some years ago, every application for water service "outside the city limits" had to be brought before the management committee. Thus it swamped itself with those details that were the subject of its order. On the other hand, by

adroit reference to precedent, operating executives increased their actual responsibility for policy and action in fields not the subject of interest of the management committee, but did so at the expense of progress, since precedent provides no basis for advance.

THE PROBLEM OF REORGANIZATION

When a new machine is installed—for example, a new electric pump—the entire operating force of the water utility, executives and employees alike, understand that the old steam pump it has replaced was junked because it was obsolete. There is no feeling of resentment or any desire to protect the new electric pump from ultimate replacement for similar reasons of further improvement at some future date. This general statement remains true even though the new electric pump can be operated by one employee per shift, no longer requiring both an engineer and a fireman.

On the other hand, when a new method of organization such as a new office system is installed, executives and employees do not always understand that this came about because the system in use was obsolete and deserved to be replaced. There is sometimes the keenest kind of resentment, even though, as was true in Denver in a recent case, the immediate effect of the new installation was to increase employment.

This situation may be paralleled in other fields. The public, for example, objects strenuously and effectively against the use of enforcement methods of reasonable and sensible character to bring about reduction in water waste by deliberate and irresponsible wasters. On the other hand, there is far less resentment against installation of meters, which accomplish the same result even more directly.

Thus there are two very different fields of reorganization activity within the water utility: that in which reorganization is brought about chiefly through installation of machinery or other construction and that in which reorganization is largely a matter of retraining and reassigning personnel. The one field, of course, shades into the other. The length to which the physical type of reorganization has been carried in recent years in water utilities is suggested in the following:

1. Water utilities in the larger cities are reorganizing their physical plant on the assumption of perpetual operation. Thus, according to Spurr, small water utilities in boom towns have been allowed depreciation rates recovering the entire capital out of rates in twenty to twenty-five years.¹⁵ On the other hand, the two largest private companies, typical of the larger municipal water utilities also, were assigned depreciation rates on depreciable property equivalent to ninety-three years, the estimated average life for the Indianapolis Water Company, and ninety-one years, the average life for the Hackensack Water Company's property.¹⁶ Obviously these long-life rates are made possible only by use of the most durable construction, plus maintenance at the highest possible percentage condition.

2. Reorganization of physical plant for maximum fire-prevention effectiveness has also progressed far toward its goal. Thus the Los Angeles water utility, from date of purchase in 1902, has increased its mileage of pipe 4 inches in diameter or less,¹⁷ of little value in fire protection or water circulation, from 240 miles to 1,100 miles.¹⁸ It increased its mileage of larger pipe, useful in fire protection and water circulation from 60 miles to 2,700 miles. Detroit's water system started in 1824 with wooden pipes.¹⁹ By 1930 the water utility reported 2,757 miles of permanent pipe, less than 20 miles being of the 4-inch size unusable for fire protection.²⁰ In the smaller metropolitan water utility of Erie (in 1933), out of 250 miles of distribution system, 225 miles were 6 inches or larger, effective for fire protection.

3. Similar reorganization of the physical equipment of pumping

¹⁵ H. C. Spurr, *Guiding Principles of Public Service Regulation* (Washington, D.C.: Public Utilities Reports, Inc., Munsey Bldg., 1924), II, 488-95.

¹⁶ *Ibid.*

¹⁷ Anon., *A Tale of Two Water Plants* (Denver: Denver Union Water Co., 1909), pp. 1-3.

¹⁸ Board of Water and Power Commissioners, *Annual Report* (Los Angeles: Board of Water and Power Commissioners, August, 1933), pp. 50-53.

¹⁹ G. H. Fenkell, *A Descriptive Survey* (Detroit: Board of Water Commissioners, October, 1928), p. 8.

²⁰ Board of Water Commissioners, *Annual Report* (Detroit: Water Department, 1930), pp. 67-69.

plants has also taken place. Thus in 1919 Erie water-utility cost of coal for pumping a million gallons of water was \$8.43. Still using steam power, Erie was able to show a cost for coal of \$3.94 per million gallons pumped in 1933.²¹ In Denver the cost in 1919, 1920, and 1921, using coal, was about \$22 per million gallons pumped, the cost including all maintenance and operation. Using gas and electricity, the Denver cost in 1933, 1934, and 1935 has averaged about \$15 per million gallons pumped.²²

Similar reorganization where it is not possible to throw the burden upon capital additions or replacements has not made such rapid progress. Some of the reasons for this lag are:

1. Physical improvements are commonly planned and originated by the operating executives. If approved by the top executive and the trusteeship committee, they are pressed vigorously by the operating executives, who take great pride in keeping plant and equipment in the front rank. Changes in human conditions, on the other hand, are commonly originated by the trusteeship committee or the top executive, and are handed down from above.

2. In private business reorganization can and does cope with unco-operative or obstructionist executives or employees by dispensing with their services. In the municipal water utility civil service hampers such action. As a result reorganization may have to fight its way inch by inch against the outspoken resistance of executives or employees. The new system or plan of organization may have to be intrusted to its own violent enemies, namely, the employees and executives displaced by the change. Politicians do not hesitate to step in to organize this resistance for their own ends. The public sides with the employees, perhaps taking the position that reorganization is a kind of punishment, to be barred from "model" municipal employment.

An example of a reorganization problem involving the water-utility personnel rather than its capital is presented as the *Annual Report* for 1933 of the Cicero water utility. This community, for

²¹ Commissioners of Water Works, *Annual Report* (Erie, Pa.: Commissioners of Water Works, 1933), pp. 40, 46.

²² Water Department, *Annual Operating Report* (Denver: Board of Water Commissioners, 1935), p. 50.

years, had indulged in three improper operating practices. Meter readers had been permitted to report as the amount of water used, the minimum bill equivalent in water. As a result, meter-readers in many cases did not read the meters at all; in others, perhaps deliberately misread them in order to report the minimum bill. The second defective operating practice consisted in leaving a meter in service, without repair, even though it had entirely ceased to register the passage of water. The third defective operating practice consisted in faulty maintenance of the poorly constructed pipe system, thus permitting excessive system leakage.

Accumulating for years, these practices finally produced an intolerable situation in the form of excessive deficit between what Cicero, a suburb, was paying Chicago for water plus its water-utility expenses, and what the citizens of Cicero were paying for the water service. This finally forced the trusteeship committee, the city council, into action. A new executive was employed to head the water utility. A survey made by accountants showed where the trouble was. Cicero, with a deficit of \$35,000 in 1931, was paying Chicago the sum of \$78,000 for water which disappeared in the Cicero system, not paid for by Cicero citizens.

A firm of consulting engineers was then employed to find the leaks. They found one hundred and thirty-three such leaks under the streets, wasting nearly two million gallons per day. The saving this represented in water purchased from Chicago paid the cost of the leak survey in forty-two days.

The meter-readers went to work reading the actual figures of water consumption shown by the meters. One-third of the meters, found out of order, were repaired and placed back in service. Customers complaining about high bills were forced to repair leakage on their own premises before excessive back charges, accumulated during the period of defective meter-reading, were compromised. As a result, in the words of the report itself:

In 1933 the water purchases decreased nearly \$12,000 over the previous year. . . . Water billings, on the other hand, increased \$30,000. . . . Approximately 50,000,000 cubic feet of water which previously had not been accounted for was registered through meters in 1933.²³

²³ F. J. Broz, *Annual Report* (Cicero Ill.: Bureau of Water, 1933), pp. 23-25.

It seems incredible that any business, even a small municipal water utility, should have to reach such a defective operation level before effective support could be found for the money-saving and common-sense reorganization described. It emphasizes the relatively greater difficulties faced in reorganization of the human side of the water utility than the physical side.

Denver offers an illustration of similar character encountered in reorganization of its system of making the seventy thousand flat rate bills sent out to its customers quarterly. There was, of course, no emergency to force action as was true in Cicero. There were, however, several careful reports of experts pointing out to the trusteeship committee the defects in the existing system of billing and the advantages of improvement. These finally provided the incentive for action.

The predecessor private water utility was purchased by the city in 1918. Beginning with 1910, however, its private owners were faced with the certainty of ultimate municipalization, the public having refused to renew the franchise in that year. The municipal water utility, therefore, inherited a billing system, installed before 1910, that was already beginning to be regarded as deficient and unprogressive. This system of pen-written bills, based upon the skill and integrity of the bill-writer, who also posted and corrected the master billing record and created and posted the customer adjustments, continued in use with little change down to 1934.

Not only was the method of creating the bills obsolete in 1933, but also the basing method of flat-rate billing was obsolete. Denver is one of the few large cities in the United States that has taken no real steps toward installation of meters and measurement of water used as the basis of the bill. The flat-rate billing base is obsolete because it is not possible, by house-to-house inspection of fixtures in use, to create as accurate a record as that furnished by the meter; because the assembly of flat rates for this and that fixture is more arbitrary in its final charge than is a charge based on the record of water used; because customer adjustments are a matter of inevitable dispute, not capable of solution by reference to an exact meter record; and because the flat-

rate system uses more labor and less machinery in the inspection and office system and therefore is inherently more costly. No attempt has been made to improve the customer's bill and reduce the cost by moving toward universal metering. The less important problem of reorganization of an obsolete billing system was finally accomplished.

Each step of this comparatively minor problem in reorganization involved a battle of some sort. For example, experts had pointed out the folly of sending out nearly seventy thousand bills at the same time four times a year, thus creating an enormous peak in collections and billing activity, followed by a two months' interval to the next peak. It was decided to change the billing, so that one-third of the city would be billed each month. This was done; it at once met with opposition from the real estate owner, large and small, who owned property in different parts of the city. It had been a convenience to him to receive all his water bills at the same time for all parts of the city. It increased his bookkeeping to have to pay water bills in one part of the city in one month, in another part the next month, etc. As a result of this opposition the water board refused to change the technical billing dates, so that the system of staggered billing, as installed, attempted to collect from one-third of the city one month in advance of the technical billing date for the particular quarter; the next third received their bills as they are accustomed; the final zone of the city was billed one month late. The natural result has been that at first over half, and gradually lesser, percentages of the owners billed one month in advance refused to pay until the actual billing date, requiring extra work in sending out a second followup bill.

Ultimately the public may be expected to forget the implications of the technical billing date and accept the new rotation system. By that time the water board might well refuse to incur the expense of adjusting the billing date to the facts by adjusting one quarter's bills by hand, subtracting a month's charges from the prebilled zone and adding one month's charges to the post-billed zone. It is reasonable to suppose that compromises of this sort, required in order to get something done, are the origin of

many of the curious inconsistencies in the practices of publicly owned and managed enterprises.

For over a year the attempt was made to bill by means of the usual electric billing machine, which is posted by hand with the variable billing data and which then creates the bill, printing the totals at various points and adding the nonvariable data such as the date and type of bill. This installation got a bad start with the employees of the billing and accounting division. They fought it bitterly and successfully even to the point of more or less open sabotage. The chief gain of this prolonged battle was acceptance of the idea of a new billing system as inevitable. Among the employees, even the staunch supporters of the system of hand billing gradually admitted that return to it was improbable if not impossible.

At the beginning of the following year the operating executives of the accounting and billing division, with the full knowledge of the interested employees, expressed their preference for experimental installation of a particular type of punched-card billing equipment. During the succeeding year this equipment was installed, employees were retrained in the new routines, and billing became successful. Among the incidental gains of the new punch-card system of billing of interest from a management standpoint are the following:

1. Some years before, in order to save billing time and cost, and in order to reduce customer disputes, the water utility had abandoned itemization of the customer bill, thus converting the groups of fixture rates at each premises into a customary lump sum, paid year after year as long as it remained unchanged, without protest. The new punch-card bill, once the card had been properly prepared, placed on the individual bill, in addition to the total and the current adjustments of arrears and prepayments, the more important details concerning the fixture rates themselves. This resulted in much improvement in the bills, through customers coming in to protest against inclusion of improper items on their bills. There has been an important increase in customer goodwill.

2. Guaranteed accuracy of billing, provided the punch-card

machine has been given accurate facts, brings into focus the real heart of the problem of flat-rate billing, namely, proper establishment of the facts through inspection of premises, proper translation of these facts into the individual rates for billing purposes, and accurate transfer of these results to the punch-card record. The rate, theoretically for use of water, charged against an automobile kept on the premises of two dollars per year, or fifty cents per quarter, illustrates the problem. When an inspector finds an automobile is kept on the premises, he reports the fact. Assuming that it reaches the billing record properly, the practice is not to remove such a charge even though the inspector, on subsequent trips to the same premises, does not happen to report an automobile there. To get the automobile charge off it is necessary for the inspector to make a positive finding that no automobile is being kept there. This procedure clearly is necessary because of the movable character of the automobile.

The real gain from the new system of billing and related improvements has been in control, which is here used in the accounting sense. The C.P.A. audit of the Denver water utility for 1934 and 1935, the first real audit of this type in its municipal history, reviewed this question in the following words:

The new duties and services performed . . . are all important, and while each one has added to the cost, the additional cost is fully justified. By far the greater part of the increased cost, in fact almost all of it, should be charged to the cost of obtaining and maintaining administrative controls which did not previously exist. Too much importance can not be attached to this factor. The lack of proper controls leads to errors in billing and collection and creates a condition in the office which contributes to carelessness, arbitrary treatment of consumers, and, in fact, actual dishonesty.²⁴

Experts studying the former hand-billing system believed that substantial reduction in cost could be obtained. This financial saving has not been realized. As in many other phases of reorganization, there are other management aspects than direct money-saving. By dividing all office costs except general administration and engineering by the number of bills produced, the C.P.A. auditors came to the conclusion that, under hand billing and hand

²⁴ C. W. Collins, *Report on System and Methods* (Denver: Clem W. Collins & Co., March, 1936), p. 45.

accounting, the cost per consumer billed had averaged about \$1.66 per year. Under punched-card billing and machine accounting, the new conditions, the cost per consumer billed, at its maximum point immediately after installation of the new system and before time had evolved all the cost advantages, will be, in 1936, \$1.84 per year. This amounts to the difference, in this particular Denver case, between 5 and 5.5 per cent of annual income expended on office costs.²⁵

In the Denver water utility, from 1933 to 1936, almost every phase of human organization and system was reorganized, with, generally speaking, similar disappointing results from the standpoint of large savings in dollars. While individual pay was changed around and individual responsibilities were reorganized, no one was fired; no new blood was brought in; and no methodical study of individual duties by means of time study or in any other manner was attempted. What happened to the savings made by reorganization, so that they did not appear on the surface, is indicated as follows:

1. Reduction in the average working-week for all employees from an average of forty-four hours to an average of about forty hours, or about 10 per cent, was only partly offset by pay reductions. Since much utility work consists of machine and position tending, there has probably been little gain in efficiency by the shortened hours.

2. A large number of "merit" increases in pay were made. In addition, all long-service employees were placed on the monthly pay roll, thus giving three hundred and fifty instead of two hundred and fifty annual vacations with pay.

3. A formal sick-leave plan was put into effect, costing about 1 per cent of pay roll each year.

4. Much new work, such as the new accounting controls, was undertaken. For example, the fourteen thousand street valves are now being tested about annually by a group of regular employees.

THE SPREAD OF CRITERIA-MINDEDNESS

The importance of the so-called planning movement to the operating executives of the water utility lies in the spread of

²⁵ *Ibid.*, pp. 43-47.

criteria-mindedness. Criteria, in so far as they can apply to water-utility operation, are merely formulations of the basic objective of rendering a satisfactory service to a certain group of citizen-customers. Criteria differ chiefly in the particular bias of the formulator. Thus there are criteria from the federal public health point of view and from the point of view of national "social responsibility." At the opposite extreme there are criteria of internal balance, formulated by the operating executives themselves and written into the operating budget, or formulated by the water board and written into the customer rules.

Criteria play an important part in smoothing the way for system reorganization. A criterion has much the same effect as installation of a new machine. It has already been pointed out that operating executives and employees have accepted with comparative good grace substitution of electric pumping for steam pumping, cutting employment in half and imposing the necessity of learning a new operation routine upon the surviving employees. Similarly, the federal public health criteria concerning cross-connections with other unprotected water supply and concerning the potability control of the municipal water supply have been almost universally accepted and enforced by operating executives and employees, even though they result in conflict with powerful customers and necessary development of higher personal skill and care in operation. It cannot be argued that the federal government has achieved this by dint of higher authority, the only lever available to it being approval or disapproval of the particular water supply for use in passenger cars of interstate railways. Local pride, motivating water boards, top executives and operating executives alike, has been the real force. Here was a reasonable criterion, precisely formulated, capable of attainment by improvement not of plant but of system, that was attained with little internal opposition.

Some of the criteria, now generally accepted by water utilities or likely soon to be accepted, are as follows:

Criteria of social responsibility.—The basic criterion, as suggested by Black, is that every house must be equipped with hot

and cold running water and have a private inside toilet.²⁶ It follows that water utilities must abandon the present practice of turning off water for nonpayment of bills, or at least must modify the practice. Other agencies of the city government must face the problem of providing living units not so equipped with such facilities.

During this last depression this has been a live issue with metropolitan water utilities, forced to acquiesce in the social responsibility point of view by delaying turnoff of thousands of delinquent customers for months. In some cities health authorities have insisted that no house containing a water closet be deprived of water service as long as it was occupied. Experiments have begun with partial turnoff in such cases, thus depriving occupants only of the luxury uses of water.

Water utilities must soon face the fact that their monopoly of portable water supply carries as its natural converse the responsibility of furnishing water for the necessities of life to all without charge or taint of charity. Something akin to the free public fountain or town pump is reappearing. Thus the Manila Metropolitan Water District, a modern American water utility, has continued the age-old practice of providing free water for the poor at public hydrants.²⁷ It is probable that water utilities will soon realize that the practice has merely been temporarily interrupted in this country.

Criteria of maximum efficiency in fire protection.—The National Board of Fire Underwriters has been very successful in bringing about great improvements in construction and in operation of water utilities in larger metropolitan cities, with the end in view of maximum fire protection. This has been done through preparation of a detailed engineering study of each system, which, with recommendations, is then printed and made available to the officials and executives of the water utility. This report forms the basis, in part, for the determination of basic fire insurance rates

²⁶ R. V. Black, *Criteria and Planning for Public Works* (Washington, D.C.: U.S. Public Works Administration, June, 1934), chap. x.

²⁷ M. Villalobos, *Annual Report* (Manila, P.I.: Metropolitan Water District, 1932), pp. 6, 7.

for the particular city and for its subdivisions, especially as between commercial and residential districts. Its commendations and recommendations are taken very seriously, especially by operating executives, who press every opportunity to persuade the trusteeship board and top executive to take further steps suggested by the report.

Good operating practice, according to the fire underwriters, may be summed up as follows: There must be stability of management and of working force. Routine engineering records must be up to date and complete. Water-utility employees must respond to fires and aid in operating valves and hydrants. Hydrants and valves must be well maintained, and must, under careful sample tests, show performance capable of meeting estimated fire hazard in the particular part of the city. There must be ample water supply close to the city. Pumping stations must be well located, and capable of operation under conditions of partial breakdown. Water pressure must not fluctuate below the minimum required for successful operation of automatic sprinklers. The distribution system must be well arranged for transportation of large volumes of water to the points where it will be needed in case of fire. Customers must be metered, so that their wastefulness will not deprive the water system of its excess capacity needed for fire-extinguishing purposes.²⁸

Criteria of "scientific" meter-rates construction.—The work of the New England Water Works Association and of various experts has developed among operating executives the goal of a scientific meter-rate structure toward which to plan and to work. Thus the New England Water Works Association some years ago recommended a two-part rate, consisting of a service charge separate from the charge for water measured through the meter. This service charge was to cover the cost of the meter and service, plus one dollar per year for reading and billing, plus a variable charge for unregistered water leaking through the meter.²⁹

²⁸ National Board Engineers, *Report on the City of Denver, Colorado* (New York: National Board of Fire Underwriters, 85 John St., February, 1928 [superseding 1910 and 1921 reports]), pp. 1-40.

²⁹ Allen Hazen (chairman), *Final Report of Committee on Meter Rates* (Boston: New England Water Works Association, February, 1916), pp. 3-7.

Where the opportunity to revise the meter rate has been presented, operating executives and top executives have worked long to try to develop an "ideal" or "scientific" meter rate for their cities. The influence of the New England proposal may be seen in the actual rate structures of many American cities.

Criteria of the operating budget.—Formulation of an operating budget and its acceptance by the trusteeship committee have an enormous effect upon the operating executive. His minor construction or system projects, pet ideas and necessities, acquire new status when they appear in his "allowed" budget. If the budget appeals to him as fair he will spend long hours at cutting and fitting it mentally to permit accomplishment of all he wants to do, without overrun. If the budget seems unfair, he will spend equally long hours trying to circumvent it, either by finding some additional funds or, as a last resort, by honest economy. Most budgets, from the standpoint of the particular operating superintendent, are a mixture of both fairness and injustice to his department or subdepartment.

The operating budget, like most criteria, has drawbacks if carried to an extreme. Inflexibility, for example, brings its own reward in work not properly done. The budget does not entirely solve the age-old problem of overemphasis because of a good salesman executive in one division or department and underemphasis in another. The budget contains nothing to indicate whether a particular part of the business could be operated more economically; in fact, without much outside study, the budget may freeze the existing way of doing things and the existing allocation of the total operating allowance between divisions. With all its defects, however, the budget does provide the trustees, the top executive, and the operating executives with a yardstick by means of which to measure relative progress in the course of the year. Water utilities think, through their executives, in terms of broad criteria or formulations of phases of their basic objective of service. The budget performs a similar purpose of stating the limits of expenditure for accomplishment of this service goal, and of showing each operating executive what his limits of expenditure are, if he is to fit himself into the total allowance.

The new criterion of "optimum" balance.—Closely related to the operating budget is the new criterion of optimum balance of income, operation and maintenance expense, development of plant and equipment, and population growth and shift. During the era of rapid population growth and rapid evolution of water-supply inventions, now drawing to a close, all that water-utility executives could do was to concentrate on the major problems of catching up with growth. Now that population growth is clearly slowing down, especially in the heart of the metropolitan center where the central city water utility chiefly operates, it is possible for the more mature point of view of optimum balance to develop. It no longer seems likely that water-utility executives of the next generation will have to contrive to expand their water systems fast enough to meet such forecasts as were made seriously a few years ago, predicting 7,000,000 for the Philadelphia Metropolitan Region by 1990; 2,256,000 for the Washington Region in 1980; Denver, 1,000,000, and the East Bay Region, 2,000,000—both by the year 2000; or Los Angeles 8,000,000 by 1960.³⁰

One of the most difficult problems to which to apply the criterion of optimum balance is with respect to building in over-capacity. Thus Erie built its first substantial lake intake in 1896. This conduit in 1933 was reported to have a maximum capacity of 36,000,000 gallons a day, compared with average daily consumption of 20,000,000 gallons. In 1932 a second intake was constructed, adding its maximum capacity of 70,000,000 million gallons a day. Thus Erie has given itself the safety factor of two separate intakes, with a combined capacity of five times the present daily consumption. Doubtless Erie was justified in this

³⁰ Regional Planning Federation, *Population Trends* (Philadelphia: Regional Planning Federation of the Philadelphia Tri-state District, December, 1930), p. 4; Washington Region Water Supply Committee, *Reports and Plans, Washington Region* (Washington, D.C.: National Capitol Park and Planning Commission, 1930), p. 89; H. S. Crocker (chairman), *Report of Engineering Board of Review to Board of Water Commissioners* (Denver: Engineering Board of Review, 1922), pp. 15, 16; East Bay Municipal Utility District, *The Story of Water* (Oakland, Calif.: East Bay Municipal Utility District, 1931), p. 29; T. Merriman, *Letter from T. Merriman—to W. P. Whitsett—in Regard to the Water Requirements* (Los Angeles: Metropolitan Water District, July, 1931), p. 6.

expenditure, for example, in greater ability to choose water of good quality. It merely illustrates the problem facing the operating executive at every turn in every part of the water system. Generally speaking, it has been the practice of municipal water-utility executives to build in far more overcapacity than was characteristic of private predecessor companies. This added factor of safety has been justified as necessary because of the rapid increases in population and great shifts of population out toward the suburbs. With slower population change extreme overcapacity in particular structures may well prove to be an expensive monument to municipal overconfidence.³¹

Another difficult problem to which the criteria of balance must be applied is that of the ultimate relationship of suburbs and central city. This problem must be solved by the trusteeship committees and the top executive, but, of course, with the co-operation of the operating executives. If we may say with confidence that the typical water-utility trusteeship committee has periods of instability, it is even more true to say that the relations between two such committees, one representing the central city water utility which has by huge expenditures assured itself an ample water supply and the other representing the suburb, anxious to grow and resentful of interference, are more often strained than happy. The reasoning of the criterion of balance works strongly toward a solution. If the central city water utility has the capacity to serve the suburb, capacity unlikely to be used within the central city, it is obviously an unbalanced situation to deal harshly with the suburb and encourage or force competitive development of a duplicate water system. The political motive of using water shortage to force annexation petitions is gradually giving way before the more logical motive of construction of a metropolitan water system. Thus Baltimore, required by state law to provide water supply for suburban pipe systems, now, as a matter of operating routine, prescribes main sizes and routes both inside and outside the city limits, to the end of developing the metropolitan distribution system in balanced fashion.

³¹ Commissioners of Water Works, *op. cit.*, pp. 66, 68.

SUMMARY

This discussion of management of the municipal water utility at the operation level has considered the organization of departmentation. The point has been made that functional organization seems almost universal, except at the lowest subdepartmental levels, where territorial departmentation is the common rule, in order to provide for unified responsibility for scattered centers of operation. There is a rather clear-cut line of demarcation between the functions reserved for direct contact with the trusteeship committee and the functions commonly placed under the top executive of the water utility, of operating character.

The main objective of the municipal water utility is to render satisfactory water service. This main objective may be restated in detail as expressing itself in different types of motivation of policies, such as desire to provide for future enormous population growth, desire for good public relations, desire to get along with the municipal government, desire for good employee relations, desire to improve operating conditions, and desire for economy. This main objective may also be reformulated, viewed from various standpoints, such as the public health criterion, the social-responsibility criterion, the fire-protection criterion, the scientific criterion, the criterion of the operating budget, and the criterion of optimum balance.

Under conditions of instability of the trusteeship, committee policies are not persevered in, and delegation of authority is restricted and of temporary character. It is believed that the less stable the trusteeship committee the farther down into the operating organization tends to be concealed the responsibility for policy.

Reorganization brings into its true light the relatively large responsibility for policy exercised by operating executives and even by employees. Operating executives have, in general, favored replacement of obsolete equipment, but have developed very slowly a similar attitude toward obsolete systems and methods. Development of detailed formulations of the service objective as "criteria" has been an important factor in stimulating operating executives and employees toward replacement of obsolete method and system.

